Lesson Plans to Incorporate Archaeology into the 5th grade Curriculum in the Southwest Michigan Public Schools
(aka Archaeology CSI, Cultural Scene Investigation)

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Acknowledgements

First I would like to thank the administration, Mrs. Teri Peters, Climax-Scotts Elementary School Principal, Mr. Doug Newington, Superintendent, and a special thank you to Mrs. Sarah Paige-Gruber for allowing me to incorporate archaeology into the 5th grade classrooms last Fall at Climax-Scotts Community Schools. I realize that it was out of the ordinary, and took time from your planned lessons and for this I am truly thankful. I can attest that Climax-Scotts have a fantastic group of teachers that want to provide their students with the best possible education and are willing to look outside the box to achieve that. Thank you to all of the 5th grade students in her classroom and Mr. Jim Verdon’s classroom that were patient, and full of enthusiasm while we worked our way through the lessons.

A special thank you to my professor, Dr. Michael Nassaney, who has always encouraged me for one more rewrite, let’s revise this and try it again. While frustrating at times, he wanted to make sure I did the best job possible and his support and willingness to work with an older student that wasn’t a full time student was extremely helpful and I couldn’t have come this far without his expertise and encouragement. My other committee members Elspeth Inglish, who has also been extremely encouraging and sees the value in what I’m doing, which makes it all worthwhile. Dr. LouAnn Wurst, while no longer at WMU has also been a source of encouragement throughout the last couple years.

The Fort St. Joseph Archaeological group from the summer of 2012 and all of the Anthropology graduate students that I have known over the last several years will forever be in my heart, as they are one of the best sources of encouragement and pats on the back just when you needed it most. You are all awesome! I wish you all the best in your future endeavors.

Lowe’s Toolkit for Education deserves a big thank you for believing in my project by funding it for $5,000. Thank you for giving back to the communities you are in and believing in the future of our students. Kalamazoo Institute of Arts donated pottery from their students which helped to take our dig to the next level, thank you. To all my friends and family who found bits and pieces of bones, old toys, and interesting things here and there for me to bury in the dirt. Who would have thought you’d find something just to have it buried again. 😊

And finally to my wonderful family, and my husband, Mark who created all of the archaeology boxes, even when it was too hot out and put up with my revisions, stubbornness, and questions at all times. To my Mom, who I know wishes I would slow down, but has always been supportive and there just to talk when I needed her. And to my sons, Chris and Dan who have supported me and let their crazy Mom do something out of the ordinary and joined me in digging dirt, loading the archaeology boxes, breaking perfectly good dishes (I just couldn’t do it), and being there when I just needed a hug.

Thank you all, your support means more than you can ever know.

Sue Reichert
In the Fall of 2015 I had the privilege of working with the Climax-Scotts Elementary School and teachers from the school that agreed to incorporate Archaeology into their 5th grade curriculum. Sarah Paige-Gruber, one of the 5th grade teachers who teaches Social Studies to both 5th grade classes, agreed to work with me to make this happen. The summer of 2015 I had attended a week long course offered by Project Archaeology with their new program, Investigating Nutrition, in order to go back and teach this program in my area. Because this was targeted towards 6th grade, I was able to use many of the lessons and made some slight alternations for the fifth grade class. Having some of the lessons from Project Archaeology may draw some additional interest from teachers and more of the Project Archaeology lessons can be done at different grade levels.

We began teaching the lessons in early October 2015 doing two lessons per week, one class at a time. At the time, we only had 7 lessons, but based on feedback, I developed additional lessons to put more focus on the tools, and paperwork that is involved in conducting archeological investigations. Positive and constructive feedback from the teachers and students was extremely helpful in finalizing these lessons. Because of the success of the lessons, we will once again take this to the fifth grade class in the Fall of 2016 with the revised lessons, which are now included. Having additional adults available for the actual archaeological investigations we feel would be extremely helpful, if not essential, to provide the students with the best opportunities.

Included is a brief summary of how each lesson is structured. It includes a suggestion for a pre-lesson on archaeology and archaeologists which gives the instructors some tools that are available to all to conduct it. Each lesson has an objective, student learning objectives, duration recommended for each lesson, class size, a list of materials needed for both the student and the teacher. A list of Michigan standards, which includes Common Core and Next Generation Science Standards (NGSS), Grade Level Content Expectations (GLCE) are included for most lessons. A list of vocabulary words that each lesson covers and background information for the instructors is in each lesson. All worksheets that are needed by the students are included and follow each lesson. Recommended assessments are listed and there is a final series of assessments at the end of the lessons which include fill in the blank, and true and false formats.

We were awarded a grant from Lowe’s, Inc. for $5,000 and were able to build four simulated archaeology excavation boxes and able to purchase supplies to do a simulated dig. A huge thank you to Lowe’s for this opportunity through their Lowe’s Toolkit for Education grants. Because of this, included are instructions for the design of the boxes and a list of materials. While it is understandable that not all schools will be able to build simulated archaeology boxes, variations can be made to create a different type of simulated dig. It may be on a small scale in totes, or laying out photos, or actual items on paper will work. Some of the excitement that was felt by the students was the ability to get their hands dirty. Any time you can incorporate a hands-on lesson, the students will remember it for a long time, which reinforces what they have learned.

I hope with the excitement of these lessons, we will be able to teach students at an early age the importance of our heritage and the value that our past has on our future. The hands of our heritage will be in their hands, and I hope that you find the following lessons helpful in educating your students.

Sue Reichert
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Lesson Plan Format*

**Objective:** The main idea that students will acquire.

**Essential Question(s):** Questions that guide the lesson.

**Student Learning Objective(s):** A list of concepts and skills that students will learn.

**Student Outcome:** A list of activities that students will engage in to learn the concepts and grasp the understandings.

**Subjects:** Subjects that are covered in this lesson, including common core, state and other important standards.

**Duration:** Amount of class time that this lesson takes. These are recommended times and may need to be adjusted by the teacher due to available time. Some lessons may be split into sections as necessary.

**Recommended class size:** Recommended class size for this lesson.

**Materials:** Items needed to complete the lesson. Items needed for the student; the entire class; and items needed by the teacher.

**Vocabulary words:** New words covered in this lesson.

**Background Information/Lesson Structure/Setting the Stage:** Information on the direction of the lesson, how to plan for it, and content to be shared with students.

**Assessment:** Method for students to demonstrate that they understand the concepts and what was covered in the lesson.

*Not every one of these steps will be included in each lesson.*
Pre Lesson:
In order to set up for Lesson 1 it is recommended that the teachers and students do some preliminary work and watch at least one video and/or read a short story, or book/magazine on archaeology. A list of suggested materials follows. A list of tools used by archaeologists is included for familiarization that will be helpful for upcoming worksheets and discussions.

Materials:
Student: Tools Used by an Archaeologist Worksheet.

A list of resources available to everyone is listed below.

Helpful websites:

http://archaeology.mrdonn.org Contains numerous sections on tools, grids, labeling, record sheets, what is the job of an archaeology, lots of questions answered.

www.nps.gov/Archeology/public/kids/index.htm A site created by the National Park Service.

www.nps.gov/mwac/junior/juniorRangersweb.pdf Good resource document from the Midwest Archeological Center, National Park Service.


https://projectarchaeology.org This is a great resource for teachers and some of the lessons have been adapted from Project Archaeology. Books and classes are also available to teachers.

Videos available on line:


http://pbskids.org/video/?pid=t3Pgif5auAyv9bJJ71U0aN_KqHDeBPy A longer video that begins as a cartoon, SciGirls, but follows two girls that attend an archaeology camp with real people. A good video that shows differences between pictographs, petroglyphs, troweling, documentation, measuring, screening, washing, cleaning and coming up with conclusions, 25:55.
http://www.pbs.org/time-team/experience-archaeology/tools-trade/  Archaeologists explain about the trowel and how they use it; Culture of the Trowel. Also at this site is a list of tools that archaeologists can use, 2:59.

http://www.pbs.org/video/2365014677/  So You Want to be an Archaeologist? A short video on deciding to be an archaeologist, including attending a field school, 2:49.

https://www.youtube.com/watch?v=qMzpA5oCGNY  A short video by National Geographic Kids Dig into Archaeology, 1:02.

Books/Magazines:


Dig into History magazine, published 9 times a year. Each issue is theme-related with a special 10 to 12-page section that focuses on an archaeological discovery or topic related to the issue’s theme. It complements the principles of Common Core and offers a great springboard for discussion, curriculum-related projects, and cross-disciplinary lesson plans. Past issues are available. There is also an online teacher’s guide available at www.cricketmedia.com/teacher-resources.


https://projectarchaeology.org  Books on Intrigue of the Past, Investigating Shelter and Investigating Nutrition, along with other selections, are good resources for teachers. There is a special section for teachers and Project Archaeology also hold classes throughout the year for educators and archaeologists. Project Archaeology, Montana State University is a joint program of the U.S. Department of the Interior, Bureau of Land Management and Montana State University.
Tools Used by an Archaeologist

Here are only some tools that might be used by an archaeologist:

- **Shovels** are used to carefully scrape away larger sections of soil (dirt).
- **Trowels** are used to carefully remove small amounts of soil (dirt).
- **Measuring tools** such as tape measures and rulers are used to document where an artifact or feature is found.
- **Lots of Paperwork**, including grids, are used to document everything that is found.
- **Pencils** are used to help document everything.
- **Paintbrushes** are used to brush away small pieces of soil or debris from an artifact.
- **Dustpans** can be used to move the dirt into the bucket to be screened, and the **broom** to carefully brush away dirt.
- **Buckets** are used to move the soil (dirt) to the screens.
- **Screens** are used to sift through **ALL** of the soil (dirt) to make sure no small pieces of artifacts or evidence are left behind.

Can you think of other tools that may be used? _______________________________
Lesson 1 – Observation, Inference, and Evidence
(Adapted from Project Archaeology, Investigating Nutrition*)

**Objective:** To use the tools of scientific inquiry, understand the differences between observation, inference, and evidence.

**Essential Question:** How do archaeologists study the past?

**Student Learning Objective:**
Use observation and inference to come up with important questions.
Use data and evidence to research answers to their questions.

**Student Outcome:** Differentiate between observation, inference, and evidence.

**Subjects:** Social studies, language arts, science

**CCSS and NGSS:** R1.7, L.6, RH.4, AQDP, PCO1

**Skills:** Remember, understand, apply, analyze, evaluate

**Understanding:** Explanation, interpretation, application, self-knowledge

**Duration:** 45 – 60 minutes

**Class Size:** Any; groups of two to three

**Materials:**

**Student:**
- Illustration of “Observation, Inference, and Evidence”
- “Observation, Inference, and Evidence data collection sheet

**Teacher:** Slide of “Observation, Inference, and Evidence” and data collection sheet.

**Vocabulary Words:**
- **Evidence** - data that are used to answer questions
- **Inference** - a conclusion derived from observations
- **Inquiry** - an organized investigation to learn new information or solve a problem
- **Observation** - recognizing or noting a face or occurrence
- **Question** - something that is asked to guide the inquiry process

**Background Information**
Scientists may not use the same procedures in exactly the same order, but most scientists rely on a methodical application of observation, inference, and data collection to answer their questions. Anything being studied must first be observed, whether using the naked eye, a microscope, or from a satellite, a similar process is used. An inference is a reason or idea proposed to explain an observation and it often raises questions for further investigation. When scientists have completed the process of observing, inferring, asking questions, and gathering data, they use evidence to answer their questions.
**Background Information:** (continued)
Archaeologists use observation and inference to learn how people lived in the past. By making observations about objects (artifacts and sites), they infer the behavior of the people who used the objects. For example, when archaeologists find the remains of a large village (observation), they could infer that the people were farmers because a large village needs a large food supply. To find out if that is the case, they would look for evidence of farming such as farming implements (like hoes) and food remains from crops (corn cobs and squash seeds).

**MISCONCEPTION ALERT! Archaeology and Excavation**
When people think about archaeology they usually imagine archaeologists excavating in exotic places, like Egypt. While excavation is an important part of archaeology, it is not the only way archaeologists learn about the past. Many sites are visible on the surface and a lot can be learned just from mapping and basic recording procedures. Archaeologists also study existing collections and records in museums to learn more about sites that have already been excavated. After the fieldwork is complete, archaeologists spend much of their time in the laboratory analyzing the information and reporting their findings to other archaeologists, scientists, and to the public.

**Discussion**
Suggest the following scenario to the class: Imagine that you wake up late one Saturday morning and the house is quiet and you remember that your parents had to get your sister to an early soccer game. As you walk into the kitchen, still half asleep, to eat breakfast you see that your family did not clean up after preparing and eating breakfast.

Ask students: How would you know what your family had for breakfast?

List the student responses.

Using the responses, ask the students: Which ideas demonstrate observation? Which ideas are inferences? What are some questions we might ask about the people who left the remains of their breakfast? How might we use these questions to find out more?

How do archaeologists study the past? Tell the students that this question will guide their learning. Go over the vocabulary list, archaeological site (which they had in Lesson 1); along with evidence, inference, inquiry, observation, and question and tell students that they will use these words as tools and define them during the lesson.


2. Explain that the illustration shows a scene from the past (picture of the cabin, with a root cellar, hoe, grain bin, sickle, hen house, skeleton of a chicken, broken canning jar with lid still attached, overturned metal cooking pot, wooden wheelbarrow with a wheel missing, a mature apple orchard) used and abandoned by people. It is an example of a place that archaeologists might study. Students will use the illustration as they learn to do a scientific inquiry.
Lesson 1 – Observation, Inference, and Evidence
(Adapted from Project Archaeology, Investigating Nutrition*)

Discussion: (continued)
3. Write the following words on the board: observation, inference, and evidence. Inform students that they will be using these words in the activity.

4. **Observation**: Ask students: What do you notice about the illustration? Have them list six or more objects and observations on their data collection sheet. As the students are working, they may have questions about how the people lived. Encourage them to record their questions under number 1.

5. Tell students: Your next step is to make some inferences about the different kinds of food these people might have eaten or activities they may have participated in.

6. **Inference**: Ask students: What inferences can we make based on our observations? Have them write an inference for each of their observations on their data collection sheet.

7. Tell students: Asking good questions can help us to find out more about what foods the owners of this cabin produced and ate or activities they participated in. Write these two questions on the board:

   “Did they grow or raise their own food?”

   “What foods may they have produced and eaten?”

Ask students: Which question is the better question? Why?

**Guide students to recognize that questions answered with yes or no are too narrow and do not give us any guidance to move forward to find out more.**

Meaningful questions usually begin with Where, What, Why, Who, or How.

8. **Questions**: If students have not written any questions under number 1 on their data collection data sheet, encourage them to do so. Or, they may add additional questions.

9. Have students share their questions in small groups. Assist students with improving their questions, if necessary.

10. Tell the students: We are going to use evidence to answer our questions. For example, if we asked the question, “How long ago did people live in this house?” the wheelbarrow would be evidence that people lived here a long time ago. **Evidence**

    Have students complete step 3 on the data collection sheet using their observations and list of objects (data).
Discussion: (continued)

11. Assist students with defining **observation**, **inference**, and **evidence** and adding them to their Vocabulary list.

12. Explain to students that the illustration of the cabin and its surroundings is an example of an archaeological site – a place where people lived and left objects behind – and that they have just conducted an inquiry similar to how archaeologists do.

13. Use the background information and “Misconception Alert: Archaeology and Excavation” to show students that archaeologists can learn a great deal by observing sites and artifacts on the ground surface.

Based on the inquiry process you just completed, would you change the investigation of what your family ate for breakfast?

Write some examples on the board of the students’ observations and inferences to show that students had different inferences for the same observation. Ask students: How do you explain the differences in inferences? Use the background information to lead a discussion on the possibility of obtaining multiple plausible inferences from a single observation.

Ask students: How have we used inquiry to learn about people?

Give students a few minutes to write what “Observation, Inference, and Evidence” means to them.

**Assessment:** Review of their writings on observation, inference, and evidence. Teacher observation.
Observation, Inference, and Evidence Worksheet

Observation, Inference, and Evidence: Data Collection

In the chart below, list some of the objects that you see and make an observation and two inferences for each observation.

<table>
<thead>
<tr>
<th>Object</th>
<th>Observation</th>
<th>Inference</th>
</tr>
</thead>
<tbody>
<tr>
<td>trees</td>
<td>There are rows of trees behind the cabin.</td>
<td>The trees were a fruit orchard. The trees were a shelter belt.</td>
</tr>
</tbody>
</table>

1. As you observe the picture, what questions do you have about it, and about the people who may have lived there? Write three or more questions.

2. Think about what makes a good question. Choose your best question and write it below.

3. Answer your best question using the data chart above. What is your evidence?
Lesson 2 – What is Archaeology?

Objective: To define and understand what archaeology is and what an archaeologist does.

Student Learning Objectives:
- Students will be able to describe what topics an archaeologist would and would not study.
- Provide a written description of a modern object in a way that an archaeologist would describe an artifact.

Duration: 45 – 60 minutes (may be split into smaller sections)
Class Size: Any; groups of two to four

Materials Needed
Student:
- What is Archaeology Worksheet
- Mystery Object Worksheet

Teacher:
- 4–5 everyday objects that the students will examine (water bottle, coffee grinder, whisk, etc.)
- Pictures of different things studied by archaeologists (temples, rock images, dig sites, etc.)
- Pictures of things NOT studied by archaeologists (dinosaurs, animals, oceans, etc.)
- An empty soda can

Vocabulary Words:
• Anthropology – The study of humans, past and present to understand cultures across all of human history. Anthropology looks at knowledge from social and biological sciences as well as humanities and physical sciences.
• Archaeology – A method for studying past human cultures by analyzing material evidence through artifacts and sites.
• Archaeologist – A person who studies past human cultures through material remains.
• Archaeological Site – A place where human activity occurred and material objects were left behind.

Lesson structure (recommended):
Pass out What is Archaeology? worksheet and ask students to write down what they think archaeology is. Then ask them to circle those items that an archaeologist would study and place an “X” on those items that an archaeologist would not study.

What question would you like and try to answer using archaeology?
As an archaeologist, what would you look for to help answer your question?

Give them about 5 – 10 minutes to complete individually.

• Ask the students what objects an archaeologist would find if they were to look in their bedroom? (Give them an example to begin, “An archaeologist would find a lot of books in their bedroom.”)
Lesson structure (recommended), continued:

- Tell the students that archaeology is one of many ways that scientists study humans. Explain why it is important to have multiple fields of anthropology, *(which is the study of humans and their cultures)*. Briefly describe some other subfields of anthropology:
  - Linguistics *(the study of language and the influence of language in social life)*
  - Ethnology *(Similarities/dissimilarities / Cultural (workings of societies around the world)*
  - Physical / Biological *(long term development of the human variation; think Darwin)*

- Describe what types of things archaeologists study, discuss their worksheet.
- *(Archaeologists do NOT study dinosaurs, paleontologists do.)*
- Describe exactly what types of things archaeologists study and introduce new vocabulary.
  - Objects and evidence of past human activities
  - Artifacts, features, plant/animal remains, organic material *(aka ecofact)*, and sites.
- Describe things that an archaeologist would NOT study.
  - Dinosaurs, oceans, animals, etc.
- Emphasize to students that archaeology is NOT treasure hunting. Ask the class to come up with differences between archaeology and treasure hunting. Write answers on the board.
  - *Archaeology is a science and uses methodology, procedures, and has a code of ethics. Note keeping and protecting sites and artifacts is very important. Archaeologists want to share what they learn with others and work with diverse communities to learn about past human behaviors. It is extremely important that recording the context of finds is done.*
  - *Treasure hunting is done to gain money, notes are not kept, and the site/context is not protected. Treasure hunters care more about money than learning and rarely try to learn about past human behavior from their finds.*

- Discuss with students why archaeology is important. *It can shed light on past human behaviors, and is one way to learn about diverse cultures, many of whom did not leave written records.*

Now that the class has a better understanding of what archaeologists do, they will work in groups to describe some “mystery” objects in a way that an archaeologist would. “Now that you all know what an archaeologist studies we are going to examine some objects that I’ve brought in”.

First, as an example I have this object *(hold up a soda can)*, it seems to be made of metal and there is writing on the outside of it. There is a small opening at the top with an oval piece near the opening. The writing and the cylinder are different colors, and there are some numbers written on it as well. The object is quite light, and it is empty. I think it may have been used to hold something, and may have been worn as a necklace by threading a string through the oval tab.” Sit the students in groups and pass out the *Mystery Object worksheet* and object. Give students about 10-15 minutes to complete the activity, and then gather back as a group, collecting the items from each group.

**Note:** You may come up with another object to use to start the students thinking other than a soda can, use your imagination and have fun with it. You know your students better than anyone and what would capture their attention.
Lesson 2 – What is Archaeology?

**Discussion**

1. Once all groups have finished their worksheets and the class is back together, hold up each item that each group had and ask the group that studied that item what they noticed about it and what they think it is. After the group that studied it has given their answers, ask the rest of the class if they notice anything else about the item or know what it is. Let them know what it is, if they haven’t already identified it.

2. Ask the students what they used to study the objects (sight, touch, sound, etc.). Ask what other ways the objects could have been studied (weight, measurements, etc.)

3. Ask the student what all of the items have in common, and write responses on the board. If after students have had a chance to answer and nobody has stated that all of the objects were made by humans, put this response on the board and discuss that an archaeologist could study all of these things because they were all made by humans.

4. Discuss with the class how archaeologists are only able to learn about the past if archaeological sites are protected, and that if people do not protect sites it will be almost impossible to learn about past human behaviors using archaeology.

5. Ask students to think about the question they wrote on their first worksheet, (what question would they like to try and answer using archaeology). Explain how once archaeologists have a question that they want to answer, the next step in the archaeological process is to find a site that will help answer their question.

**Assessment**: Informal teacher observation, worksheets, and responses given during discussion will be used to determine if the learning objectives have been met.
What is Archaeology?

Look at the following pictures. Circle the picture if it is something that an Archaeologist would study. Put an “X” over the picture if it is something that an archaeologist would NOT study.

What question would you like to try and answer using archaeology about one of the items above?

What would you look for to help answer your question?

Use the back page if necessary.
Modern Mystery Object
(Adapted from the National Park Service Midwest Archaeological Center’s Junior Ranger Artifact Analysis Worksheet)

**Type of Artifact:**
Describe the material that the artifact is made from: bone, pottery, metal, wood, leather, glass, paper, cardboard, cotton, plastic, other material:

**Special Qualities of the Artifact:**
Describe how the artifact looks and feels: color, shape, texture, size, weight, moveable parts, anything printed, stamped or written on it.

**The Artifact’s Uses:**
What might it have been used for?

Who might have used it?

Where might it have been used?

When might it have been used?
What does the Artifact Tell us?
What does the artifact tell us about the technology of the time in which it was made and used?

What does the artifact tell us about the life and times of the people who made it and used it?

Sketch the Artifact Below:
Objective: In the study of context, students will use a game and a discussion to demonstrate the importance of artifacts for learning about past people and where you find them in relation to each other is crucial.

Essential Question: How do archaeologists study the past?

Student Learning Objective: Archaeologists study artifacts in context to learn about past people.

Student Outcome: Students will demonstrate the importance of artifacts in context.

Subjects: Social studies, Language arts, Science

CCSS and NGSS: SL.1, SL.5.1.C, SL.5.1.D, L.6, RH.4

Skills: Remember, understand, apply, create, evaluate

Understanding: Explanation, interpretation, application, self-knowledge

Duration: 30 – 60 minutes, or split lesson into two different 30 minute sessions.

Class Size: Any; groups of four

Materials:

For each student:
- The instructions/worksheet and checklist for “Context Game”
- A “Location Card” /with all members of a group receiving the same room/location
- A blank index card for each student (one color per group if possible)

For each group (group of 4 is recommended):
- A Context answer sheet for brainstormed ideas and guesses.

Teacher:
- Make a copy of the “Location Cards” and cut them apart for distribution.
- Make a copy of the “Instructions and Checklist for the Context Game and Context Answer Sheet
- Gather additional supplies needed for the Context Game; index cards.
- Teacher Instructions are listed after assessment section.

Vocabulary Words:
- Artifact - any object made or used by people
- Context - the relationship artifacts have to each other and the situation in which they are found.
Background Information:
The things people own can tell something about the owners. The object(s) a person has can indicate that person’s age, gender, and interests. For example, a baseball bat and a football helmet in someone’s bedroom suggest that the owner likes sports. Posters of pets and a collection of stuffed animals could mean that the person is an animal lover. The objects (artifacts) can tell a complete story only if they are found together, where their owners left them (in context). Archaeologists rely on the objects that people made (artifacts) and where they left them (context) to learn the story of past people.

Think of a prehistoric pottery bowl, beautifully painted. It has a very different meaning if it is found at a prehistoric site in a grave than if it is found full of corn in an ancient storage room. Its meaning changes further if it is found in someone’s modern living room – the bowl has now lost its original context and all connection with its prehistoric owners; it has become only a thing and cannot tell us very much about the people who made or used it.

Archaeologists preserve the context of artifacts they recover from sites by recording the location of everything they find. The artifact and its context provide more information to the archaeologists than just the artifact alone. When context is lost, information is lost.

“The Game of Context” will demonstrate that removing artifacts from a site removes them from their context and makes it very difficult to get a complete understanding of past people.

Discussion: Remember our previous discussion about waking up late on a Saturday morning, the house was quiet and you remembered that your parents took your little sister to her soccer game. You see that your family didn’t clean up after eating breakfast.

Ask students: If I had never met you and your family and I walked into your kitchen that morning, what could I infer about your family’s eating habits from the things found in the kitchen?

What if when I walked into the kitchen, it had been cleaned up except for one cereal box which is sitting next to the dog’s food dish. How would cleaning up the kitchen and the placement of the cereal box change what I might learn about your family and their eating habits?

What would happen to a story if a chapter were torn out of a book? How might that affect the readers’ understanding of the story? For example, I want to know the story of your family’s eating habits at breakfast time by looking at the objects they used and left behind, but the kitchen is clean when I arrive. How is this like a chapter torn out of a book?

I have a game for you that will help you better understand the meaning of context as it relates to the science of archaeology.
**Context Game:**
1. Distribute one copy of the “Context Game Instructions/Worksheet” to the group (this will be used by the Checker, once assigned, in each group.

2. Distribute the “Context Game Answer Sheet” to the group (this will be used by the Recorder, once assigned, in each group.

3. Review the instructions with the students (Note: Make sure the students in each group have enough familiarity with the location that they can imagine what objects might be there.)

4. Play the game.

**Context Game Outcome Notes:**
1. The more artifacts you have the easier it is to infer what the location is because there are more relationships (context) to give you clues.

2. When artifacts were taken away, it was more difficult to guess what the location was.

3. **Context** - the relationship artifacts have to each other and the situation in which they are found.

4. As you lose information, it becomes harder to guess what room or location it is.

**Closing discussion:**
1. Remembering the “Observation, Inference & Observation” site in the previous lesson, imagine that the tools had been removed. How would that have changed what you know about the daily life of those people that lived there?

2. Explain how objects left in context can tell more about people than if the objects are removed from context.

**Assessment:** Informal teacher observation, worksheets, and responses given during discussion will be used to determine if the learning objectives have been met.
Lesson 3: Context (Teacher instructions for game)
(Adapted from Project Archaeology, Investigating Nutrition)

**Instructions for Teacher:** The students are going to play a game that will help them understand the meaning and importance of context in archaeology. *Due to available time, you may only have time to distribute cards and have the drawings made. You can then continue at the next session with inferences.*

1. Divide into groups of four and assign each group a number from 1 to 6 (this will be dependent upon how many students are in the classroom).

2. Assign the following roles in each group:

   A. **Recorder** - they will record inferences made by the group
   B. **Card Handler** – they will be responsible for passing and receiving cards
   C. **Checker** – they have a check list that they will need to check off each task as it is completed.
   D. **Presenter** – they will present their group inferences to the entire class

3. Distribute a different location card to each group. Have them keep this location a secret from the other groups in the class.

4. Distribute blank index cards to the card handler in each group, enough so that each student will have their own blank card. Have the card handler write the group number on the blank side of each card. *[Using colored index cards works well, so each group has a different color]*

   Have the card handler give a card to each person in their group.

5. Describe the next steps to the classroom:

   A. Each group has been given a room or location.

   B. As a team, brainstorm artifacts (objects) that might be found in this room or location.

   C. Each person in the group select a different artifact (object) from the brainstormed ideas and make a drawing of an artifact on the blank side of their card. *For example, if your group has a day care center, one student might draw a crib, another student may draw a rattle, and so on.*

   D. Because drawing skills may not be at a level that is easily recognized by others, have the group decide and label one of the drawings with the name of the artifact.
Lesson 3: Context  (Teacher instructions for game, continued)
(Adapted from Project Archaeology, Investigating Nutrition)

6. Have the card handler collect all of the group’s cards and upon your instructions Group 1 will pass their stack of cards to the card handler in Group 2; Group 2 to Group 3; and so on. Give the students approximately 3-5 minutes to lay out their stack of cards so everyone can see them and as a group, infer what the room or location is. Remind them to discuss it quietly so other groups cannot hear. Have the recorder write down their inference on their answer sheet.

7. Call time, and have the card handler remove one artifact (index card) from the stack and place it face down on their desk, then have them give all of the remaining cards to the next group. Repeat this for every pass until each group has had all of the other group’s cards and you are down to just one card left [dependent upon how many groups you have].

8. One at a time, have the Presenter from each group inform the entire class what room/location they guessed for Group 1, and Group 1 shares the identity of their room or location. If the group makes an incorrect inference, the Presenter records the correct identity. Do this for each group starting with the group that had the least amount of cards for that group, to see if just one card was more difficult to determine a room or location than a group with multiple cards and artifacts.

9. Go through the final questions on their answer sheet:

❖ What did you notice about your ability to make inferences as objects (artifacts) were removed?

❖ Was it easier or more difficult to make inferences? Have them explain their answer.

❖ Define context again and explain why it is important to the science of archaeology.
<table>
<thead>
<tr>
<th>a camp in a campground</th>
<th>a fast food restaurant</th>
</tr>
</thead>
<tbody>
<tr>
<td>a football stadium/game</td>
<td>a school cafeteria</td>
</tr>
<tr>
<td>a family kitchen</td>
<td>a garden shed in a backyard</td>
</tr>
<tr>
<td>a kid’s bedroom</td>
<td>a baseball game/park</td>
</tr>
</tbody>
</table>
Lesson 3
(Adapted from Project Archaeology, Investigating Nutrition)

Group # ____________

Context Game Instructions/Worksheet

Step 1: Assign roles in your group as listed below:

<table>
<thead>
<tr>
<th>Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorder</td>
<td>____________________________ Record inferences</td>
</tr>
<tr>
<td>Card Handler</td>
<td>____________________________ Pass and receive cards</td>
</tr>
<tr>
<td>Checker</td>
<td>____________________________ Check off each task as it is completed on sheet</td>
</tr>
<tr>
<td>Presenter</td>
<td>____________________________ Present inferences to the entire class</td>
</tr>
</tbody>
</table>

Completed: ________ (check when Step 1 is completed)

Step 2: You will be given a location card, the Card Handler will share this with the entire group. **CAUTION: Keep the location secret from other groups in your classroom.**

Completed: ________ (check when Step 2 is completed)

Step 3: Using the index cards provided each person in the group draws a picture of something that you would find in the location. Put the number of your group on the back of the index card if not already provided. **SELECT ONE ARTIFACT DRAWING FROM YOUR GROUP AND WRITE THE NAME OF THE ARTIFACT ON THAT CARD.** **DO NOT WRITE THE NAMES ON THE OTHER CARDS.** Only one card will have a name on it.

Completed: ________ (check when Step 3 is completed)

Step 4: The Card Handler will gather all the cards, when given the ok, give index cards with the drawings on them to the next group.

Completed: ________ (check when Step 4 is completed)

Step 5: With the new set of cards, the Card Handler will lay out the cards, as a group quietly discuss where you think the location is looking at the drawings. Use the number on the back of the cards to indicate which group they are from. Once you have inferred (guessed) a room or location based on the clues (artifacts), the Recorder will record where you think the cards room or location is. The Recorder will record this on a separate sheet provided.

Completed: ________ (check when Step 5 is completed)

Continue on next page or reverse side
Step 6: Card Handler will remove 1 card from the group of cards and place it face down on their desk. Then give the remaining cards to the next group.

Completed: _________ (check when Step 6 is completed)

Step 7: Continue with Steps 5 through 6 until all of the groups have had each set of location cards. Each group should have only one card left at the end. The Recorder will continue to record your group’s inference at what each location is.

Completed: _________ (check when Step 7 is completed)

Step 8: Once given the OK by your teacher, each group will be asked what they inferred each location was, doing one at a time. This will be done by your Presenter.
Lesson 3  

**Context Game**  

**Group # ___________**

*Answer sheet – This sheet will be completed by the Recorder*

As a group infer (guess) what each group room or location is. When you decide, write your inference below:

**Group 1**

Where do you infer this is? _____________________________________

Were you correct?    Yes    No  

**Group 2**

Where do you infer this is? _____________________________________

Were you correct?    Yes    No  

**Group 3**

Where do you infer this is? _____________________________________

Were you correct?    Yes    No  

**Group 4**

Where do you infer this is? _____________________________________

Were you correct?    Yes    No  

**Group 5**

Where do you infer this is? _____________________________________

Were you correct?    Yes    No  

**Group 6**

Where do you infer this is? _____________________________________

Were you correct?    Yes    No  

Was it easier to make an inference with many clues (pictures) / artifacts (objects)?

How difficult was it to make an inference with only one clue (picture) / artifact?
Lesson 4 – Stratigraphy and Cross-Dating

**Student Learning Objective:** Students will learn how archaeologists determine how old things are through the use of stratigraphy and chronology.

**Student Outcome:**
Interpret archaeological strata using the law of superposition.
Apply cross-dating to determine the age of other artifacts.

**Subjects:** Mathematics, Language Arts, Social Studies, Science

**CCSS and NGSS:** RI.7, SL.1, L.6, RH.4, 5.GA.B3; 5.GA.1; 5.GA.2.; HS ESS3-1

**Skills:** Remember, understand, apply, create, evaluate

**Understanding:** Explanation, interpretation, application, self-knowledge

**Duration:** 30 – 60 minutes

**Class Size:** Any; groups of two to four

**Materials:**
**Students:**
- Stratigraphy Layers Worksheet  (Answer: G, F, A, E, B, D, C)
- Site Near Climax-Scotts Worksheet
- Cross-dating Worksheet

**Teacher:**
- 5 books, try to have some of different colors and thickness, for demonstration only.
- On a slide to project, **Examples of Stratigraphy**
- On a slide to project, “Site Near Climax-Scotts” and “Cross-dating” worksheets

**Vocabulary Words:**
- **Chronology:** an arrangement of events in the order in which they occurred.
- **Cross-dating:** the principle that diagnostic artifacts dated at one archaeological site will be the same approximate age when found elsewhere.
- **Data:** information, especially information organized for analysis.
- **Stratigraphy:** the layering of deposits in archaeological sites.
- **Stratum:** one layer of natural and/or human-generated materials (strata, plural)
- **Timeline:** a visual representation of events in chronological order.
- **Diagnostic artifact:** an item that is indicative of a particular time and/or cultural group; for example; a computer would be a diagnostic artifact of the modern age.
- **Law of Superposition:** Cultural remains and natural sediments become buried over time; the layer on the bottom is the oldest, the layer on the top is the youngest.
Background Information:
Natural materials such as rocks, soil, and plant and animal remains occur on the earth’s surface and can accumulate in layers. Each layer or stratum may be distinguished by its physical characteristics: color, texture, and structure. Similarly, materials of human origin are also deposited onto the earth’s surface. In archaeological sites natural and human-generated materials occur together in layers. These layers, called **strata**, form a record of past events that archaeologists analyze and interpret.

The materials deposited first are the oldest and are always found at the bottom of a given stratigraphic section. The most recently deposited materials are the youngest and are always at the top. This concept is known as the **Law of Superposition**. It always applies except when some type of disturbance has occurred. (Examples of disturbance may include a plow from a tractor, well drilling, or rodent activity).

**Strata** in archaeological sites provide archaeologists with temporal (time) and spatial information. All of the artifacts in a given stratum will be of approximately the same age, while those in strata above or below will be younger or older respectively. **Cross-dating** can indirectly establish a date for artifacts and sites. Artifacts such as stone projectile points and pottery were made in distinctive styles through time. A modern example is automobiles: you wouldn’t mistake the style of a car made in the 1920s with one made in 2016. If an arrow point was found in association with a hearth that was radiocarbon dated to be 500 years old, it is assumed that the arrow point is the same age. When that style of arrow point is found at another site, the archaeologist would assign the site and the arrow point an age of approximately 500 years old. Often cross-dating is the only method archaeologists have to determine the age of sites.

Some sites represent a single occupation. However, it is not unusual for a site to contain evidence of repeated occupations. Stratified sites can show culture change over time and have the potential to give clues about the relationship one group of people had to those who came before or after them. Because of the great information potential, and the rarity, archaeologists regard stratified sites as particularly important.

When an archaeological site is vandalized or artifacts are removed, knowledge about past cultures is lost forever. Damage to stratigraphy by unauthorized digging or plowing, destroys the information that could be obtained under controlled scientific excavation. The removal of diagnostic artifacts from a site often removes all possibility of determining the site’s age.

**Setting the Stage:**
1. Stack 5 books on a table, if possible of different thicknesses and color.

2. Tell the students that the books were placed in their positions one at a time. Ask them which book was placed in position first? Which one was placed last? This illustrates the Law of Superposition.
3. Ask students if they have been to a place where you can see layers of soil or rocks? Examples might include road cuts or stream banks. Have the students describe what these places look like to the rest of the class. Explain to students that each book represents a layer (stratum), of sediment or soil that is deposited over time. **Stratigraphy** is the study of strata and archaeologists use stratigraphy to determine the relative age of buried artifacts.

4. Show the slide of Stratigraphy Examples for illustration purposes.

**Procedure:**

1. Using the Stratigraphy Layers worksheet, have the students list the stratigraphic layers from oldest to youngest. (Answer: G, F, A, E, B, D, C)

2. Using the “Site Near Climax-Scotts” worksheet as a guide, draw a layer near the bottom of the whiteboard or project it on a screen. Show how artifacts are deposited as people live on top of the layer. Then a new layer of sediments is deposited on top of that, by natural processes or by another group of people leaving different types of artifacts. This happens several times until the stratigraphy is built up to present-day levels.

3. Distribute the “Site Near Climax-Scotts” worksheet to the students. The artifacts on the “Site Near Climax-Scotts” worksheet have been dated based on the age of the stratum in which they are found. If you found similar artifacts elsewhere, would you know approximately how old they are? Yes. This concept is known as cross-dating. An artifact type that has been dated in one place can be dated when found elsewhere.

4. Hand out the “Cross-dating” worksheet to the students. Have them determine the approximate age of the artifacts based on the information from the “Site Near Climax-Scotts” worksheet.

5. Ask students if they would be able to study the stratigraphy of a site if the strata had already been mixed up by illegal digging. If someone took an arrow point, what kind of information would they have removed from the site?

**Assessment:** Have students turn in their completed “Site Near Climax-Scotts” worksheet for evaluation.

**Optional:** Using the “Site Near Climax-Scotts” activity, have the student make inferences regarding the artifact placement that goes from 0 -1,000 years ago.

- What would have caused this? [farming with plows, digging post holes, well digging, rodent activity].
- How do you date artifacts that are placed like this? [other methods can be used, for example, what is the item made of?]
- Any markings such as “Made in USA, or Made in China?”
Lesson 4: Examples of Stratigraphy
List the stratigraphic layers from oldest to youngest:

____  ______  ______  ______  ______  ______  ______  ______  ______
Site Near Climax-Scotts

Key:
- tire
- fire
- hearth
- pop can
- pottery
- mano & metate
- projectile point
- rock
- basket
- necklace
- pot sherd

0 – 200 years ago

200 – 800 years ago

800 – 1,500 years ago

1,500 – 8,000 years ago

8,000 – 12,000 years ago

Name: ____________________________
An archaeologist found these artifacts near your town. What is their approximate age?

1. _________________________________
2. _________________________________
3. _________________________________
4. _________________________________
5. _________________________________
It may be necessary to split this lesson into multiple sessions so that students understand how to use the grids when recording the locations of the finds. Because of this, there are two procedures that can be followed depending on the level of experience of the students. If this lesson is done at the beginning of the year, graphs and grids are new, so beginning with Procedure 1 is recommended. If the students have experience, you may be able to skip to Procedure 2 without doing Procedure 1. However, for a complete understanding, which they will need when doing their simulated dig, doing both Procedures are recommended.

**Student Learning Objective:** In their study of gridding a site, students will use a map and the Cartesian coordinate system, to:

1. Establish a grid system over an archaeological site, labeling each grid square.
2. Determine the location of artifacts within each grid unit.
3. Construct a scientific inquiry concerning the location of artifacts on the site.

**Student Outcome:** Students will be able to place artifacts on a grid in the proper position, in preparation for the upcoming dig and understand the purpose and construct a scientific inquiry regarding the artifacts on the site.

**Subjects:** Mathematics, Language arts, Science  
**CCSS and NGSS:** 5.GA.B3, 5.GA.1, 5.GA.2  
**Skills:** Remember, understand, apply, analyze, evaluate  
**Understanding:** Explanation, interpretation, application, self-knowledge

**Duration:** 30 – 60 minutes over multiple days  
**Class Size:** Any; groups of four

**Materials:**

**Students:** Finding a Site Worksheet  
**Procedure 1:**
- Beginning Grid Worksheets (blank graph and artifact sheet)  
- Grid – Metric Scale Worksheets (blank graph and artifact sheet)  
- Grid on a Level Sheet Worksheets (blank graph and artifact sheet)

**Procedure 2:**
- “The CS Site” Worksheet  
- “The Grid Sheet”  
- “Artifacts Location Record”  
- Rulers for measurement
Lesson 5 – Survey and Gridding a Site

Materials: (continued)
Teacher: Procedure 1:
- On a slide, Beginning Grid Completed
- Grid – Metric Scale Completed
- Grid on a Level Sheet Completed

Procedure 2:
- On a slide, “The CS Site” and “The Grid Sheet” Worksheets

Vocabulary Words:
- **Datum**: something to use as a point of origin for measuring.
- **Site Datum**: an arbitrarily established point from which the entire site is measured and recorded.
- **Cartesian coordinate system**: two- or three-dimensional graph based on intersecting, perpendicular incremented lines or planes.
- **Flake**: a thin piece of stone removed from a nodule by striking it with a flaker made of bone, antler, or other stone. Flakes have sharp edges, and could be used as cutting implements. Flakes were also further shaped into tools (e.g. arrowheads) or were left as waste by-products of flintknapping (arrowheads).
- **Grid Unit**: a specific spatial area on the Cartesian coordinate system, designated by the coordinate in one corner (usually the southwest corner).

Background Information:
1. Ask students what methods they use to look for things (jackets, homework, baseball, etc.)

2. Tell students that archaeologists usually have to look for the sites they want to study. Ask the students to recall the vocabulary covered in the first lesson and explain what an archaeological site is.

3. Describe different types of surveys archaeologists conduct and the pros and cons of each type. Tell them that regardless of the method they select to survey, archaeologists always take notes and use a process or pattern (science, not treasure hunting).
   - A. Walking (pedestrian) survey
   - B. Flying (aerial) survey

4. Pass out the “Find a Site” worksheet and have them complete the worksheets. After about 10 minutes, or when all students are done, quickly review the worksheet with the students.
5. What are some of the advantages and disadvantages of different types of surveys? (ie., flying surveys cover lots of ground but can only note large features, walking surveys can take time, but spot small items. Some sites in a jungle or desert may be impossible to walk to, or you can perhaps walk right by; however, aerial surveys allow you to spot changes in terrain and give you an idea where humans may have been at one time).

Once a site has been dug (or excavated); [or in the case of no depth to the site, the surface artifacts have been collected], it is gone forever and it can never be replaced. Because sites are destroyed during the collection or excavation processes, archaeologists record them on paper to preserve the context of all the artifacts and structures. In the future, archaeologists can study a site if good notes and maps were made.

One way that archaeologists preserve context on paper is through the use of the rectangular grid, or Cartesian coordinate system. The first step in the excavation process is establishing a grid. A site datum is set at an arbitrarily chosen location and is designated as (0,0). Two perpendicular axes intersecting at the site datum are then established and a rectangular grid is superimposed over the entire site. Each square on the ground is marked with numbered stakes in the corners, so that each square has a unique “location” referred to by its coordinates. The coordinates indicate the distance of a given point north, south, east, or west from the site datum.

As an example, sites at Fort St. Joseph may be labeled as N22 W10 (22 meters north and 10 meters west of the datum point). So, this particular site, or unit, would be referred to as N22 W10.

Once the grid is established, all artifacts and structures are measured and recorded using the system. Before excavation actually begins all artifacts visible on the surface are collected and their locations on the grid are recorded. As the excavation proceeds, materials found under the surface are similarly recorded and collected. When the archaeologist returns to the laboratory, the maps and the data recorded in the field can be used to make inferences about past events and the lifeways of the site’s inhabitants. The exact location of each artifact transported back to the lab is known – the object can be tied to its place in the site.

Being able to graph out locations of artifacts will be a critical tool for the students to use when digging and multiple lessons may be necessary to complete their understanding and mastery of the grids.
**Procedure 1:** Dependent upon the timing of the lessons, 5th grade students may not be familiar with grids yet. They may be familiar with grids with an X and Y axis and lines on the grid would be considered the degrees, therefore, intersecting lines (points) would represent a coordinate pair. It is recommended that students begin on a grid that is labeled for them, and then scaffold the lesson where everything is done at first and the teacher models the grid. Another lesson using a metric scale grid would be used next labeled in centimeters. The last grid exercise includes a grid similar to what they will be using on their dig. Students will have the option of filling in 5 centimeter points if they would find it helpful on their own.

**Setting the Stage:**
As archaeologists you have come across a site that has already been excavated and you need to document where the artifacts are located on a grid for that unit. Using the “Beginning Grid” blank graph provided they will look at the artifacts that were found and draw the artifacts on their graph using approximately the correct location. Direction coordinates of North, South, East, West and the Southwest Corner are also labeled. All archaeological units will be labeled by their southwest corner.

They will also be asked two questions:

1. Looking at the artifacts, what time period do you think this dig site represents?
   - _____ Now to 100 years ago (1900 – Current)
   - _____ 101 – 200 years ago (1700 – 1800’s)
   - _____ More than 200 years ago? (Pre 1700’s)

   These artifacts are quite new and the correct answer would be **Now to 100 years ago**.

2. On the grid sheet; Looking at how these artifacts were found, what inferences can you make?

   You may decide to make the inferences as a class discussion. **Some potential inferences if they are struggling might be that this may have been a house that had several types of china and also had young children based on the toys that were found, perhaps boys. The one toy is quite recent and may have been dropped not too long ago.**

Next is another exercise using a more complicated grid using a metric scale which is labeled, “Grid Metric Scale”. They will get another worksheet of artifacts and they are asked, once again, to graph out the location of the artifacts. They will also be asked the same two questions on these artifacts; what time period (**these are 101 – 200 years ago**); and what inferences can be made?

**Some inferences could be there was a large fireplace in this home that may have been made with nails. There was also a girl that lived here based on the broken doll. What other inferences can be made?**
Procedure 1: Setting the Stage: (continued)

The last exercise is for them to “Grid on a Level Sheet”, which is similar to what an archaeologist would use. This grid has more lines for greater accuracy, and all the coordinates are abbreviated and listed on the grid (NW, NE, SW, SE). They will be asked to graph out the artifacts presented to them, and the same two questions, what time period (More than 200 years ago) and to make inferences based on the artifacts found.

These three exercises should allow them to be quite comfortable in graphing out the location of artifacts on a grid and practice on making inferences based on what they have found.

Procedure 2:
Setting the Stage:

Have the students imagine they are a team of archaeologists who have found an archaeological site. Artifacts, including projectile points, pottery sherds, and stone flakes are scattered on the surface of the ground. They want to make a map of the site. How might they accurately record the location of the artifacts? Have the students brainstorm ideas.

When mapping out a large area, not just one unit as done in Procedure 1, but all of the units need to be placed on a grid so that accurate recording of data can be completed. This grid will be different as it contains the entire site. With that they will still use the southwest corner and each unit gets a coordinate such as (1,2); (2,2); (2,3), etc.

1. Project the map of the “CS Site” worksheet and explain this is the site they have found. Overlay a transparency grid matching the site datum points, to demonstrate that an archaeologist established a grid over the site to assist with accurate recording of data. Share background information about the importance of gridding a site for current and future study.

2. Distribute the “CS Site” worksheet to each team. Point out the site datum in the lower left corner and explain that this is the point from which the grid is established. The name of the site datum is (0,0).

3. STEP 3 and 4 IS OPTIONAL, you can use the grids already provided, however, they can create their own grid by using rulers, each team will establish a grid system using the scale 1” – 1 meter, starting from the tip of the datum (see “the Grid Sheet”). It is helpful to model this procedure on the overhead projector or using a Powerpoint presentation. As a reminder, their individual units are represented as one square on this grid system.

4. Label each point on the grid. The southwest corner of each unit becomes the reference (designation) for that unit. Example: (1,2); (2,2); (2,3). Each coordinate indicates the location east and north of the site datum.
**Procedure 2: Setting the Stage:** (continued)

5. Using the “Artifact Location Record” students will record the grid unit designation and count and name the artifacts in each grid unit.

6. Following the procedure of scientific inquiry ask:

   a. What do you notice about the distribution of the pot sherds? **(observation)**
   b. Why is there a concentration of pot sherds in part of the site? **(List some inferences)**
   c. Choose one inference and formulate a hypothesis from it. Describe how the hypothesis might be tested.

   **Example:** There are a lot of pot sherds in one location. We might infer a pottery vessel broke here. If all of the sherds have similar attributes and fit together, then we could accept the hypothesis that a vessel broke in this location. What other reason could explain the concentration of sherds?

   **Note:** The students will not be able to actually test the hypothesis without access to the artifacts. This exercise is designed to have them think like archaeologists.

   d. Conduct a similar inquiry using the stone flakes or other artifacts.

   Summarize the importance of gridding archaeological sites to assist with accurate recording and making inferences from data, now and in the future.

**Assessment:** Have students turn in their completed “Artifacts Location Record” for evaluation.

**Optional:** You can have the students precisely map artifacts within each grid unit. Measure the distance north and east of the grid unit’s southwest corner to find the exact distance of each artifact from the site datum (0,0). Examples (2.1, 4.6) or (3.3, 8.8).
Finding a Site

Identify what the best survey method (walking/pedestrian or flying/aerial) would be to locate the following sites:

1. A village in a desert: _____________________________________________
2. Rock images: ______________________________________________________________________
3. A blacksmith’s shop at a fort: ________________________________________________
4. A group of temples: ________________________________________________
5. Projectile points: ________________________________________________

List six things that you could use to help you conduct an archaeological survey:

1. ____________________________ 4. ____________________________
2. ____________________________ 5. ____________________________
3. ____________________________ 6. ____________________________

You have been asked to help a team of archaeologists find an ancient Maya city located deep in the Guatemalan jungle.

What survey method and tools would you use to help locate this site and why?
Looking at how these artifacts were found, what inferences can you make?

_________________________________________________________________

_________________________________________________________________
Procedure 1:
Lesson 5  Beginning Grid           Name: ______________________

This what you uncovered at your dig site. Graph the items on your grid to document where the artifacts were found.

Looking at the artifacts, what time period do you think this dig site represents?

_____ Now to 100 years ago (1900 – Current)
_____ 101 – 200 years ago  (1700 – 1800’s)
_____ More than 200 years ago? (Pre 1700’s)
Procedure 1:  
Lesson 5  Beginning Grid  
Name: ______________________

This what you uncovered at your dig site. Graph the items on your grid to document where the artifacts were found.

Looking at the artifacts, what time period do you think this dig site represents?

- _____ Now to 100 years ago (1900 – Current)
- _____ 101 – 200 years ago (1700 – 1800’s)
- _____ More than 200 years ago? (Pre 1700’s)
Procedure 1:
Lesson 5 Grid – Metric Scale

North

South

West

East

0      10       20        30       40       50       60      70       80       90     100

y

Looking at how these artifacts were found, what inferences can you make?

__________________________________________________________________________

__________________________________________________________________________

西南角

Southwest Corner
Procedure 1:
Lesson 5  Grid Metric Scale             Name: ______________________

This what you uncovered at your dig site. Graph the items on your grid to
document where the artifacts were found. **This time use the grid using the**
**Metric scale. Lines are at every 10 centimeters.**

Looking at the artifacts, what time period do you think this dig site
represents?

- _____ Now to 100 years ago  (1900 – Current)
- _____ 101 – 200 years ago     (1700 – 1800’s)
- _____ More than 200 years ago?  (Pre 1700’s)
Procedure 1:
Lesson 5  Grid Metric Scale             Name: ______________________

This what you uncovered at your dig site. Graph the items on your grid to document where the artifacts were found. **This time use the grid using the Metric scale. Lines are at every 10 centimeters.**

Now that you have placed your artifacts on a grid, can you tell the Size of the items?

What is the approximate size of the nail? _________________________

What is the size of the fireplace? ________________________________
Procedure 1:

Lesson 5  Grid on a Level Sheet  Name: ______________________

This is an example of what an archaeologist would use to graph their artifacts found using a grid with lines marked every 5 centimeters. Use this grid to graph out the last set of artifacts you have found. What time period do these represent?

____  Now to 100 years ago (1900 – Current)
____  101 – 200 years ago  (1700 – 1800’s)
____  More than 200 years ago? (Pre 1700’s)

Grid numbers are listed in centimeters (cm)
Procedure 1:
Lesson 5  Grid on a Level Sheet                      Name: ______________________

This what you uncovered at your dig site. Graph the items on your grid to document where the artifacts were found. This time use the Level sheet grid like an archaeologist. Lines are labeled at every 5 centimeters for more accuracy.

This edge is **North**
Procedure 1:
Lesson 5  Grid on a Level Sheet      Name: ______________________

What kind of inferences can you make based on these artifacts?
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
___________________________________________________________________
Excavation Unit Level Sheet

Project: CS Elementary 5th Grade
Site: 20KZ1516

Plan view below at __________________

Unit #: __________  Area: 1 x 1 M
Level ___________ Date: _____________
Recorder(s): _______________________
Excavators: ________________________

This edge is North

Grid numbers are listed in centimeters (cm)
Procedure 2:
Lesson 5

The Grid Sheet

(0,0) Site Datum (Southwest Corner)
Procedure 2:
Lesson 5

The Grid Sheet

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Site Datum (Southwest Corner)
Procedure 2:
Lesson 5

The CS Site

(x,y) (0,0)

Site Datum (Southwest Corner)

- X Flake
- ● Sherd
- ▲ Projectile point
Procedure 2:
Lesson 5

The CS Site

(x, y)
(0, 0)

Site Datum (Southwest Corner)

X Flake
● Sherd
▲ Projectile point

N
Procedure 2: Lesson 5

The CS Site

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X Flake

• Sherd

△ Projectile point

(Southwest Corner)
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Objective: Final preparation for the actual dig that students will be conducting. Make sure proper techniques are used for documenting and measuring.

Subjects: Social studies, Language arts, Mathematics

CCSS and NGSS: USHG ERA1 1.1, 1.2, USHG ERA2 2.1; 5-U1.1.1, U1.1.2, U1.1.3; 5-U1.2.1, U1.2.2; 5-U2.1.1, U2.1.3; 5.0A.B3

Skills: Remember, understand, apply, create, evaluate

Understanding: Explanation, interpretation, application, self-knowledge

Duration: At least 60 minutes.
Class Size: 16 - 24

Materials:

Students: Worksheets:
- The Art of Digging
- Measuring (How Deep?)
- Measuring (Location?)
- Placing the Artifact on Your Level Sheet

Teacher: Examples for projection on:
- Inches vs. Metric
- [https://www.mathsisfun.com/measure/metric-length.html](https://www.mathsisfun.com/measure/metric-length.html) contains a short video on using metric to measure
- Measuring (How Deep?)
- Measuring (Location?)
- Placing the Artifact on Your Level Sheet
- Level Sheet
- Artifact Excavation Record
- Artifact Analysis Record
- Artifact Tag

Vocabulary Words:

Artifact: an object that was made or modified by humans.
Feature: something that cannot be removed from the site. A landscape modification like a fireplace.
Provenience: 2D location of artifact.
**Discussion:**

On the board discuss the differences between an artifact and a feature. An artifact is something that can be picked up and moved without destroying it, however, a feature is something that cannot be removed without destroying it, like a fireplace, or an ash pit. Using the “The Art of Digging” worksheet have the students select those items that they think would be artifacts, and those that would be features. Review the worksheets with the students after completion.

Explain that we are getting close to being able to dig and there are some additional lessons that we need to do to make sure everyone understands the importance of documentation and proper procedures. We will be walking through the steps on measuring which will involve using the metric system.

Place the Inches vs. Metric on the overhead and explain how archaeologists and the scientific community use the metric system. They will be using centimeters to document their finds during the dig. The metric system is an international standard of measurement. Using the metric system, the entire world is able to communicate through common ways of measuring.

Using the Measuring (How Deep?) worksheet, display it on the screen and walk through the example of measuring the first artifact, a piece of pottery with inscriptions on it. When a unit is first laid out, a string is placed around the unit to mark the edges, and the ground level. They will be measuring the depth of each artifact when it is found using the string as their zero point. They will also be able to use a line level, however, at this time, we will not introduce that into the mix to avoid any confusion.

The illustration shows a side view on the wall if the artifact was still in place. Explain that it is important to take measurements and document the depth of the artifact. This particular artifact is not flat, and will not be removed until it is completely uncovered. It is important NOT to pull artifacts out of the ground. Careful troweling will need to be done to make sure it is not disturbed until completely uncovered and documented.

Walk through the first question with them, How deep is the artifact when it was first found? Using the scale already on the worksheet, they will see that it is 5 centimeters. Then either walk through the next question, or let them complete it on their own. Review the worksheet with the class when completed.

1. 5 centimeters
2. 9 centimeters
3. 12.5 centimeters
4. 14.5 centimeters

You may elect to round them up to the next centimeter.
Discussion: (continued)

Measuring (Location?) worksheet is next. Place the Measuring (Location?) up for display. Explain that not only is the depth of the artifact important, the location within the unit is also important. Remember how important documenting location was when trying to determine what went on at this site. Remind them this is important when looking at ‘context’ and making inferences. Next place the top view of Measuring (Location?) on the overhead. Walk through how each artifact is measured from the edges of the unit and that multiple measuring tools will be helpful in determining the precise location.

The first three questions have been completed and walk through each one with the class. There are then additional questions on the location of the bone (partial mandible) that the students can use the worksheet and answer. Using the coordinates of North, South, East, and West will also be important, using the Southwest corner as their beginning point.

1. North 13, East 6
2. North 13, East 11
3. North 8.5, East 7.5
4. North 5.5, East 14
5. North 3.5, East 8
6. North 4, East 16.5
7. North 2, East 14

They are also asked if there are other measurements that can be done? The more measurements they take the more accurate they will be.

The last worksheet, Placing the Artifact on your Level Sheet, explains how using the coordinates they can accurately place the artifact on their grid. The pottery piece is completed for them, however, they can use the coordinates they had for the bone to draw it in for practice.

THIS MAY BE A GOOD BREAKING PLACE IF TIME IS NOT AVAILABLE TO DEMONSTRATE PROPER USE OF TOOLS.
Lesson 6: The Art of Digging

List six tools an archaeologist may use to excavate a site:

1. _________________________________
2. _________________________________
3. _________________________________
4. _________________________________
5. _________________________________
6. _________________________________

Are the following items artifacts or features?
Lesson 6: Inches versus Metric

Archaeologists use a metric scale when doing their documentation and you will also be using the metric scale during your dig. The scientific community only uses the metric system.

You will find the scale is easy to use. Your grids will be based on centimeters which is illustrated above.

Let’s try some measurements for practice.

First, we will measure how deep an artifact is.

Second, we will measure the location of the artifact that you will place on your grid.

All measurements will be documented.
Lesson 6: Measuring (How Deep?)

Below is an example of a dig site and the artifact that was found. Using the ruler, measure **how deep** the artifact is. Using multiple measuring tools can help you do those measurements. It is also important to work together to be the most accurate.

1. How deep is the artifact when it was first found?  
   5 centimeters (cm)

2. How deep is the lowest part of the artifact?  

3. How deep is the top of the jaw with teeth?  

4. How deep is the bottom of the jaw with teeth?  

This is the string that indicates your ground level. Your measurements for depth will be taken from this string.
Lesson 6: Measuring (Location?)

Now that we have how deep the artifact is, we need to measure where it is located so we can place it on our grid. Again, using multiple measuring tools can help you do those measurements. It is also important to work together to be the most accurate.

Now you will have to place a tape measure or meter stick on the side of the unit to help determine where the artifact is located.

These are the measurements that you will need in order to place them on your grid. You have the depths, or how deep the artifact is, now we need to measure where the artifact is within your unit.

Let’s go to an overhead view of the unit to help you in measuring.
Lesson 6: Measuring (Location?)

This is how your unit looks like when looking down. You will measure from the sides of the unit.

Taking a lot of measurements will help you to be the most accurate when placing the artifacts on a grid.

Now you will have to place a tape measure or meter stick on the side of the unit to help determine where the artifact is located.

1. What are the coordinates of the upper left corner? _N13, E6_
2. What are the coordinates of the upper right corner? _N13, E11_
3. What are the coordinates of the lower piece of pottery? _N8.5, E7.5_
4. What are the coordinates of this piece of bone? _______________________
5. What are the coordinates of this piece of bone? _______________________
6. What are the coordinates of this piece of bone? _______________________
7. What are the coordinates of this piece of bone? _______________________
8. Are there other measurements that you could do? _______________________

SW    North    NE

NW  1. N13, E6
2. N13, E11
3. N8.5, E7.5

SE  5.

6.

7.
Lesson 6: Placing the Artifact on your Level Sheet

Excavation Unit Level Sheet

Project: CS Elementary 5th Grade

Site: 20KZ1819

Plan view below at: 5 cm – 10 cm

Unit #: 2 Area: 1 x 1 M

Level: II 0–20 cm Date: 11/4/2018

Is this the I, II, III, or IV level (level dug)?

Recorder(s): Charlie Brown, Matt Clark

Excavators: Sally Jones, Lucy Smith

This edge is North

Graph the bone (partial mandible) based on your coordinates.
Lesson 6/7

Level Sheet

Excavation Unit Level Sheet

Project: CS Elementary 5th Grade

Site: 20KZ1819

Plan view below at ________________

Unit #: _________  Area: 1 x 1 M

Level ___________ Date: _______________

Recorder(s): _______________________

Excavators: _______________________

This edge is North

Grid numbers are listed in centimeters (cm)

SW

North

South

NE

Grid numbers are listed in centimeters (cm)
Excavation Unit Level Sheet

Project: CS Elementary 5th Grade

Site: 20KZ1819

Plan view below at: 20 cm

Unit #: 2 Area: 1 x 1 M

Level: II 10 – 20 cm Date: 11/4/2018

Is this the I, II, III, or IV level (level dug)?

Recorder(s): Charlie Brown, Matt Clark

Excavators: Sally Jones, Lucy Smith, Aaron Scott, Maggie Greenwood

This edge is North

Grid numbers are listed in centimeters (cm)
Lesson 6

Artifact Excavation Record

Unit #: _________  Area: 1 x 1 M________
Level ___________ Date: ____________
Recorder(s): _______________________
Excavators: ________________________

Excavation Unit Level Sheet

Project: CS Elementary 5th Grade
Site: 20KZ1819_____________________

Depth and Grid Coordinates: __________________________

Excavation Procedure

How did you excavate?  
- [ ] Shovel  
- [ ] Hand (trowel)  
- [ ] Screen

Screen size:  1/4”  1/8”

Comments: ____________________________________________________________

Soil Type?  (Sand, dirt, gravel) ____________________________

Artifact / Feature Observations:

What is the artifact made of?  (bone, pottery, metal, wood, etc.)
____________________________________________________________________

Color: ____________  Shape: _________________  Size: _______________________

How was the artifact found:  
- [ ] Shovel  
- [ ] Hand (trowel)  
- [ ] Screen

Screen size:  1/4”  1/8”

Other Observations: ____________________________________________________

Sketch the Artifact:
Lesson 6

Artifact Excavation Record
Excavation Unit Level Sheet
Project: CS Elementary 5th Grade
Site: 20KZ1819

Depth and Grid Coordinates: ________________

Unit #: ___________  Area: 1 x 1 M
Level: II 10-20 cm  Date: _____________
Recorder(s): _______________________
Excavators: ________________________

Excavation Procedure
How did you excavate?

☐ Shovel  ☑ Hand (trowel)  ☐ Screen

Screen size: 1/4”  1/8”

Comments: ____________________________

Soil Type? (Sand, dirt, gravel)  __Dirt______________________________

Artifact / Feature Observations:
What is the artifact made of? (bone, pottery, metal, wood, etc.)

____________________________________

Metal

Color: __Rusty____  Shape: __Round____  Size: __8 cm (based on drawing)____

How was the artifact found:

☐ Shovel  ☑ Hand (trowel)  ☐ Screen

Screen size: 1/4”  1/8”

Other Observations: ________________

Found on same level as a nail, tin can, and padlock

Sketch the Artifact:

[Diagram of an artifact]

Lesson 6
Artifact Analysis Record

Completed after excavation in the Lab

Project: CS Elementary 5th Grade

Site: 20KZ1819

Depth and Grid Coordinates: ____________________________

Unit #: ___________ Area: 1 x 1 M

Level ___________ Date: _____________

Recorder(s): _______________________

Excavators: ________________________

Artifact Observations:

What is the artifact made of? (bone, pottery, metal, wood, etc.)

______________________________________________________________________

Color: _________________________    Shape: _______________________________

Length: _________________________     Width: _____________________________

Height: _________________________    Weight: _____________________________

Other Observations: ____________________________________________________

Sketch the Artifact:

Was the artifact found by any other artifacts or features?

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

What do you think your artifact was used for? Why? __________________________

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________
Artifact Analysis Record

Completed after excavation in the Lab

Project: CS Elementary 5th Grade

Site: 20KZ1819

Depth and Grid Coordinates: 20 cm deep, SE Corner S30 E80 (if found in the screen only give depth)

Artifact Observations:

What is the artifact made of? (bone, pottery, metal, wood, etc.)

Metal

Color: Rusty, and brown Shape: Round, circle, ring shape

Length: 8 cm Width: 8 cm

Height: 2 cm high Weight: 20 grams

Other Observations: Not misshaped, still round, no damage, other than rusty

Sketch the Artifact:

Was the artifact found by any other artifacts or features?

Found at same level as a square nail, small padlock, and tin can with no writing or label

What do you think your artifact was used for? Why?

Used to can fruit or vegetables, no jars or glass found around it, not misshaped, or no dents, so it may have not been used. Just like canning lids used now.
<table>
<thead>
<tr>
<th>Artifacts Tag</th>
<th>Catalog No.</th>
<th>Site Name / Number: CS Elementary / 20KZ1516</th>
<th>Unit #:</th>
<th>Level/Depth:</th>
<th>Horizontal Provenience:</th>
<th>Feature #:</th>
<th>Date:</th>
<th>Contents:</th>
<th>Excavators:</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

Lesson 6/7  Artifact Tags

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### Artifact Tag

**Catalog No. **Not used until Lab

**Site Name / Number:**
CS Elementary / 20KZ1819

**Unit #:** 1

**Level/Depth:** Level 1 / 10 cm deep

**Horizontal Provenience:** NW

**Feature #** N/A – not a feature

**Date:** 11/4/2018

**Contents:**
- Glue stick
- Phone case
- Nail
- Pencil

**Excavators:** Sally Jones, Lucy Smith, Aaron Scott, Maggie Greenwood

---

### Artifact Tag

**Catalog No. **Not used until Lab

**Site Name / Number:**
CS Elementary / 20KZ1819

**Unit #:** 2

**Level/Depth:** Level 2 / 20 cm deep

**Horizontal Provenience:** SW

**Feature #** N/A – not a feature

**Date:** 11/4/2018

**Contents:**
- Penny
- Doll head
- Nail
- Aluminum bowl

**Excavators:** Sally Jones, Lucy Smith, Aaron Scott, Maggie Greenwood

---

### Artifact Tag

**Catalog No. **Not used until Lab

**Site Name / Number:**
CS Elementary / 20KZ1819

**Unit #:** 3

**Level/Depth:** Level 3 / 30 cm deep

**Horizontal Provenience:** SE

**Feature #** N/A – not a feature

**Date:** 11/4/2018

**Contents:**
- Canning lid
- Padlock
- Nail
- Tin can

**Excavators:** Sally Jones, Lucy Smith, Aaron Scott, Maggie Greenwood

---

### Artifact Tag

**Catalog No. **Not used until Lab

**Site Name / Number:**
CS Elementary / 20KZ1819

**Unit #:** 4

**Level/Depth:** Level 4 / 40 cm deep

**Horizontal Provenience:** SW

**Feature #** 1 – potential fireplace

**Date:** 11/4/2018

**Contents:**
- Pottery piece
- Lead shot
- Corn cob
- Multiple nails

**Excavators:** Sally Jones, Lucy Smith, Aaron Scott, Maggie Greenwood
Objective: Final preparation for the actual dig that students will be conducting. Proper technique of trowel, screening, buckets, dustpans, brushes, etc. Also review measuring techniques from Lesson 6.

Subjects: Social studies, Language arts, Mathematics

CCSS and NGSS: USHG ERA1 1.1, 1.2, USHG ERA2 2.1; 5-U1.1.1, U1.1.2, U1.1.3; 5-U1.2.1, U1.2.2; 5-U2.1.1, U2.1.3; 5.0A.B3

Skills: Remember, understand, apply, create, evaluate

Understanding: Explanation, interpretation, application, self-knowledge

Duration: Approximately 30 – 60 minutes.

Class Size: 16 – 24; groups of 4

Materials:
- 4 – 24” x 20” x 10” deep plastic tote filled with sandbox sand
- 4 trowels per tote
- Various play artifacts in each tote covered in sand at varying levels.
- Buckets (2)
- Screens (2)
- Multiple adults to assist with proper techniques

Teacher:
- Artifact Tag Example
- Level Sheet Example http://www.focusdesign.org/apps/videos/videos/show/17586780-how-to-properly-use-shaker-screen (Time 1:13 an educational short film by the MSU Archaeology Program on how to properly use the shaker screens).
- http://www.pbs.org/time-team/experience-archaeology/tools-trade/ (Time 2:59 archaeologists explaining about the trowel and how they use it; Culture of the Trowel. Also at this site is a list of tools that archaeologists can use).

Background:
1. There are multiple ways that an archaeologist can find a site to study. One is the walking (pedestrian) surveys, maps, and also aerial surveys. Technology is also being used more and more at archaeological sites, which includes using ground penetrating radar to locate potential sites. Shovel test pits are also done to help pinpoint areas of human cultural significance.

2. Looking back at previous lessons remind students that it is possible to find artifacts by just walking and looking at the ground. However, there are times when archaeologists need to locate older objects that are buried, and they need to find a site that they want to study. They often need to conduct an archaeological excavation to learn about the people who lived there.
3. Remind students that archaeology is a science so it is important to have a careful procedure for excavating sites. Once a site is excavated, it can never be re-excavated, so archaeologists must take very careful and detailed notes. Ask students what groups might be interested in archaeological sites and why? Something has to be learned, otherwise sites should not be disturbed.

4. Ask students what tools they think archaeologists use to excavate, and correct any misconceptions. Refer back to the Tools Used by an Archaeologist Worksheet from the pre-lesson.
   
   a. Trowels, shovels, paint brushes, picks, backhoes, etc.

5. Ask students what an archaeologist might find when they excavate a site, and write down the examples on the board. When writing examples on the board, group examples of artifacts and features separately but do not explain the separation. Ask the students what the items in each group have in common? Ask them to give a few more examples of artifacts and features.

6. Ask the students to write down what questions they hope to answer by excavating this site.

7. Review proper excavation techniques with the students. Several videos are available that briefly highlight troweling and screening techniques.
   
   a. Before you begin to excavate take measurements of how deep the soil is using the measuring tape, string and the line level.
   
   b. Use the side of the trowel to pull small amounts of dirt towards you. **Do NOT use the pointed end of the trowel.**
   
   c. Remove all of the dirt from around an artifact before you take it out, do not pull out artifacts. Remember to record the location prior to removal.
   
   d. Record any artifact you find in your excavation unit, include notes on how deep the artifact was, how big the artifact is, and draw a picture of the artifact.

   SHOW THEM THE EXAMPLES OF THE ARTIFACT TAGS AND LEVEL SHEETS AND DEMONSTRATE HOW TO PROPERLY FILL THEM OUT. MAKE SURE EXAMPLES ARE AVAILABLE ON EACH CLIPBOARD FOR EACH UNIT.
   
   e. After you record the location of an artifact, place it in your artifact bag or container.
   
   f. Once you have filled your bucket, go to the sifting station with a partner. Help each other sift the dirt and place any artifacts you find in your artifact bag or container.
Background: (continued)

Proper techniques need to be demonstrated and practiced by the students prior to the actual dig.

Shallow totes can be used to demonstrate the proper troweling procedures listed above.

Have each student practice troweling and correct any improper techniques. Remind them the importance of good excavating and documentation. Make sure each student has had a chance to practice proper troweling techniques.

Demonstrating screening should be done outside. It is important for the students to NOT fill the screens with dirt and use small amounts so that no artifacts will be missed during screening.

*Good coordination between those ‘digging’ and those screening is essential.*
Lesson 7 – Examples of Proper Techniques

Use of trowels and removing dirt

Screening techniques

Document, Document, Document
Objective: Using activities from previous lessons, conduct a ‘dig’ on a 1 meter square box using proper procedures to dig, document, and make inferences on the box they are excavating.

Review prior learnings and vocabulary words.

Break into groups of 4 – 6 per box
1 – 2 students will be responsible for ‘digging’ (ideally 2 diggers, but could be up to 4 digging at one time)
1 – 2 students will be screening dirt for artifacts not found while digging
1 – 2 students will be documenting

Recommend rotating positions during the dig

Subjects: Social studies, Language arts, Mathematics
CCSS and NGSS: USHG ERA1 1.1, 1.2, USHG ERA2 2.1; 5-U1.1.1, U1.1.2, U1.1.3; 5-U1.2.1, U1.2.2; 5-U2.1.1, U2.1.3; 5.0A.B3
Skills: Remember, understand, apply, create, evaluate
Understanding: Explanation, interpretation, application, self-knowledge

Duration: At least 60 minutes
Class Size: 16 - 24; groups of 4 – 6

Materials:
4 archaeology boxes (1 meter x 1 meter x 24 inches deep, filled with top soil [stratigraphy on inside walls]

Per box the following supplies will be needed:
1 - 2 trowels per box (dependent upon number of students per box, can use more)
1 dustpan
1 whisk broom
2 buckets
1 clipboard with grid sheet, artifact tags, and pencil(s)
1 – 2 small paintbrushes
1 artifact bag or container
   Gloves (optional)
1 metal meter stick
1 tape measure (metric)
4 metal pins/round bolts for corners
   string/cording
1 sifting screen unit (1 screen for each box)
1 empty dirt box [another 1 meter x 1 meter box to screen dirt into; match numbers of box, for example, Box #1 will use Box #1D; Box #2 will use Box #2D, etc. D = Dirt]
Break the students into four groups, one group per excavation box. During the dig, two - four students will dig while the other two – four will screen and record (be sure and rotate positions). Proceed to dig area where the following items will be waiting for them:

1. Clipboard with papers (grid sheet, artifact tags and examples)
2. 2 - 4 trowels
3. 1 tape measure (metric)
4. 1 folding ruler (metric)
5. 2 paintbrushes
6. 1 whisk broom
7. 1 dust pan
8. Pencils (at least 2)
9. Bucket containing:
   a. 1 line level
   b. string/cording
   c. 4 corner pins (already in place in the built box)
   d. 1 artifact bag or container

Having additional adults available is extremely helpful to allow close monitoring of the students and to assist them with any questions and help needed in digging skills, including troweling, screening, measuring, etc.

Give the students allotted time to excavate. Once the time is over, ask the students to take their final measurements and record on their sheets before placing their artifact bags/containers in their buckets along with their trowels and other supplies and place it in the middle of their excavation box. Their clipboards can be taken back to class or placed together with their artifact bags in a large tote labeled properly, or placed in their toolboxes if additional digging will be done.

Once the dig is complete, have the students do the following:

Make sure all documentation is complete, this includes all mapping, artifacts, and labeling. Place clipboard, documentation and artifacts where instructed.

Recommended is a tote labeled for each box.

Collect all tools and place them back in their toolbox (bucket) and confirm that all tools have been returned. Any tools missing should be documented and reported to the teacher.
Your tool bucket contains the following items:

(Make sure all items are placed in the bucket after your day of excavating, your group is responsible to make sure all items make it back in the bucket. If anything is missing, please report it directly to your teacher.)

All items should be cleaned as good as possible prior to putting them in your tool bucket. A wire brush to clean your trowels will be available.

All items are labeled with your Box Number, except string.

5  Trowels (Labeled with Box Number and A,B,C,D,E on end of handle)
2  Tape measures
2  Paint brushes, 1 inch
2  Paint brushes, 2 inch
1  Whisk broom
2  Dust pan and broom
1  Line Level
1  Cord of string
6  Pairs of Gloves
1  White lid for tool bucket

These items will NOT fit in your bucket, but should be included as part of your tools you are responsible for:

2  Clipboards with 3 pencils
1  Metal metric stick
1  Lid opener to help with opening the lid of your tool bucket, this is attached to your bucket with cord.
2  Buckets for excavated soil (dirt) for screening
1  Screening unit
Objective: Using artifacts from the Dig that was conducted on the 1x1 meter square archaeology boxes, make observations and inferences about the people that were at this site. If all of the boxes were completely excavated, there will be four main time periods at various levels:

1. Current (1960 - Current)
2. 1900 - 1960
3. 1600 - 1900
4. Pre 1600

Two of the boxes 1600 - 1900 will contain artifacts from the Eastern Woodlands and French and British occupation. One box 1600 - 1900 will contain artifacts specific from the Pacific Northwest region, and the final box 1600 - 1900 will contain artifacts specific to the Southwest/Plains region. These fit within the fifth grade curriculum.

Subjects: Social studies, Language arts
CCSS and NGSS: SL.5.1.A-C-D, SL.5.3, SL.5.4, W.5.1, W.5.9, W.5.7, RI.5.9, S.DS.03.04, S.DS.04.04
Skills: Remember, understand, apply, create, evaluate
Understanding: Explanation, interpretation, application, self-knowledge

Duration: At least 60 minutes
Class Size: 16 – 24; groups of 4 – 6

Materials:
Student:
- All artifacts from the archeology boxes, including documentation which will be an important part of their investigation.
- Large paper (~ 48 inches wide) for each group to lay out their artifacts in the same order that they were excavated.
- “What Was This Site” worksheet

Vocabulary Words:
Curate: organize or manage a collection

Discussion:
The archaeologist work does not stop after excavating the artifacts, and it doesn’t stop after the documentation is completed at the archaeological site. All artifacts will need to be cleaned, sorted, photographed and reviewing the grid sheets is also done. All these things help to make the inferences and answer the questions that you had prior to your ‘dig’. Remember what those questions were?

After a dig is complete, all of the items need to be curated. This means they need to be organized and stored for future research or as a collection, perhaps in a museum.
Teacher: If time is available, cleaning the artifacts with small brushes, or toothbrushes can be done. It is recommended NOT to use water for the artifacts that they had uncovered, if for no other reason than the mess that it can cause and most artifacts were recently placed in the boxes and should not be too caked with dirt.

1. Congratulate students on a great excavation and have them get back in their groups.

2. Have the students place the artifacts on the large sheet of paper using their Level Sheet and Artifact Tags to put the artifacts in approximately the same order that they were excavated.

-It is recommended that they draw lines on their paper indicating the different levels that their artifacts were found. The depths should be available on their level sheets and their artifact tags. The first items excavated (the most modern artifacts) should be placed at the top of their paper, and the last items found (should be the oldest artifacts) will be towards the bottom of their paper.

-Give them time to sort through their artifacts and place them in the correct order on their sheets. This may require more than one class period; so being able to leave the artifacts out where they will not be disturbed is recommended.

3. Have them answer the questions on their “What Was This Site?” worksheet.
   a. What do you think the site was used for?
   b. What do the artifacts you found tell us about the people who used the site?
      Some questions you may want to ask: What did they do? How did they live? What items may have been made there, or purchased?
   c. Put together a history and identify the different people that may have lived here based on the artifacts you found. (Observation, context, and inference)
   d. Support your conclusions with evidence you found.

4. Ask the students if they were able to answer the questions that they wrote at the beginning before they started to dig, why or why not? Ask the students what other things they would like to learn about the people who used the site they excavated, what would they need to find to answer these new questions?
   a. Explain that excavations do not always answer the questions that archaeologists were looking for, however, questions should be aligned with the type of evidence potentially available. Also discuss how findings from an excavation can lead archaeologists to ask new questions which can start the archaeological process over again.
5. Ask students if they could put the site back together again (every single piece of dirt in the same place they found it). Discuss how archaeology is a destructive process, which is why note taking is so important. Tell the students to think of archaeological sites as non-renewable resources, once the site is excavated it is gone. Ask students to think of ways to protect archaeological sites (excavate only part of a site, do not excavate at all, tell an archaeologist if you find a site, etc.).

6. Explain that after archaeologists excavate a site they need to analyze the artifacts they have found and discover ways to protect their findings. Now that the excavation is complete, the next step in the archaeological process is to learn as much as we can from the artifacts that we found. Archaeologists also need to think about ways to protect the artifacts that they excavated as well as the sites that the artifacts came from. This is the curation process.

Once you are complete, it is recommended that each group place all of their artifacts back in their bags and keep artifacts from each box together for each level. This will allow them to be reused and buried again for the next class without having to start from the beginning.

Proposed boxes to excavate (to tie in with Social Studies units on Indians). Other boxes can be done to link in other social studies units:

<table>
<thead>
<tr>
<th>Pacific Northwest</th>
<th>Southwest (Pueblo)</th>
<th>Plains</th>
<th>Eastern Woodland*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salmon bones (fish)</td>
<td>Beans, squash</td>
<td>Buffalo hides</td>
<td>Deer bones</td>
</tr>
<tr>
<td>Totem poles / ivory</td>
<td>Turquoise</td>
<td>Coup (koo) sticks</td>
<td>Shell beads, tinkling cones</td>
</tr>
<tr>
<td>Dishes/pottery</td>
<td>Deer bones</td>
<td>Stone tools</td>
<td>Maize, squash, beans</td>
</tr>
<tr>
<td>Stone tools</td>
<td>Pottery</td>
<td>Pottery</td>
<td>Stone tools</td>
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<td>Stone tools</td>
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</tbody>
</table>

*Some of the boxes can be linked to the French Fur Trade, Jesuit/Catholic presence, European occupation on earlier levels, which will include items such as European stoneware, metals such as nails, etc. Fort St. Joseph in Niles, Michigan is a close site and on-going excavation is done each summer by students at Western Michigan University. The Fort St. Joseph Museum also has information available.

Assessment: Provided are three worksheets for the students to test how well they remembered the information from the lessons. These can be used as the final assessment of all of these lessons.
Now that you have completed excavating your Box, arrange the artifacts on the large paper in the order that they were excavated using your Level Sheets, artifact tags and other documentation. *(Use the back of the paper if you need more room to write).*

1. What do you think the site was used for?

2. What do the artifacts you found tell us about the people who used the site?
   
   *Some questions you may want to ask: What did they do? What did they eat? How did they live? What items may have been made there, or purchased/traded?*

3. Put together a history and identify the different people that may have lived here based on the artifacts you found. *(Observation, context, and inference)*

4. Support your conclusions with evidence you found.
Use your knowledge of archaeology to complete the concept map
The Archaeological Process

Finally, the step in the archaeological process that is ALWAYS happening is the ________________ of archaeological sites.
Use your knowledge of archaeology to complete the concept map
The Archaeological Process

Step

Research and form Hypotheses

Survey

Excavate

Analyze

Curate Artifacts

Three Tools

1. Books
2. The Internet
3. Talking to people

1. Maps
2. Airplanes
3. Groups of people

1. Trowel
2. Shovel
3. Brush

1. Scales
2. Colored pencils
3. Rulers

1. Paperwork
2. Tags
3. Storage Bins

Finally, the step in the archaeological process that is ALWAYS happening is the Protection of archaeological sites.
Use the following word bank to fill in the blanks:

Research  Protect  Excavate  Survey  Analyze  Walking
Questions  Artifact  Flying  Test  Hypotheses
Feature  Curate

1. It is important that people __________________ archaeological sites so they can be studied in the future.

2. The first steps in the archaeological process are to __________________ and form ________________ about the topic that archaeologists want to study.

3. The second step in the archaeological process is to conduct a ________________.

4. Archaeologists use _________________ and ______________ surveys to find archaeological sites.

5. The third step in the archaeological process is to ______________ a site.

6. An _________________ is something that can be picked up at a site.

7. A _________________ is something that cannot be picked up at a site.

8. The fourth step in the archaeological process is to __________________ objects.

9. The fifth step in the archaeological process is to ________________ objects.

10. The archaeological process can ______________ hypotheses, and can also create new _________________.

Use the following word bank to fill in the blanks: \textit{(Answer Sheet)}

\begin{tabular}{llllll}
Research & Protect & Excavate & Survey & Analyze & Walking  \\
Questions & Artifact & Flying & Test & Hypotheses \\
Feature & Curate  \\
\end{tabular}

1. It is important that people \textit{PROTECT} archaeological sites so they can be studied in the future.

2. The first steps in the archaeological process are to \textit{RESEARCH} and form \textit{QUESTIONS} about the topic that archaeologists want to study.

3. The second step in the archaeological process is to \textit{SURVEY}.

4. Archaeologists use \textit{FLYING} and \textit{WALKING} surveys to find archaeological sites.

5. The third step in the archaeological process is to \textit{EXCAVATE} a site.

6. An \textit{ARTIFACT} is something that can be picked up at a site.

7. A \textit{FEATURE} is something that \textbf{cannot} be picked up at a site.

8. The fourth step in the archaeological process is to \textit{ANALYZE} objects.

9. The fifth step in the archaeological process is to \textit{CURATE} objects.

10. The archaeological process can \textit{TEST} hypotheses, and can also create new \textit{HYPOTHESES}.
Please answer the following questions based on what you know about archaeology.

**Part One:** Please mark the following statements as True (“T”), False (“F”) or don’t know (“DK”).

1. ________ Archaeology is the study of fossils.
2. ________ Some of the tools archaeologists use are bulldozers, shovels and trowels.
3. ________ Archaeologists excavate sites to look for rare, valuable buried treasure.
4. ________ Archaeologists seek to understand past societies by studying what their citizens left behind.
5. ________ When all the objects have been removed from a site, the archaeological project is finished.
6. ________ It’s ok to take cool artifacts when you are visiting an archaeological site.
7. ________ You can help protect archaeological sites.
8. ________ Where an artifact was found is not really important.
9. ________ Archaeologists look for dinosaurs.
10. ________ Everything a person learns using archaeology can be found in history books.
11. ________ A person does not need special training to be an archaeologist.
12. ________ An archaeological survey involves digging up artifacts.

**Part Two:** Please use your knowledge of archaeology to fill in the blanks.

List five (5) tools that archaeologists use:

1. ___________________________
2. ___________________________
3. ___________________________
4. ___________________________
5. ___________________________
Please answer the following questions based on what you know about archaeology.

**Part One:** Please mark the following statements as True ("T"), False ("F") or don’t know ("DK").

1. **F** Archaeology is the study of fossils.
2. **T** Some of the tools archaeologists use are bulldozers, shovels and trowels.
3. **F** Archaeologists excavate sites to look for rare, valuable buried treasure.
4. **T** Archaeologists seek to understand past societies by studying what their citizens left behind.
5. **F** When all the objects have been removed form a site, the archaeological project is finished.
6. **F** It’s ok to take cool artifacts when you are visiting an archaeological site.
7. **T** You can help protect archaeological sites.
8. **F** Where an artifact was found is not really important.
9. **F** Archaeologists look for dinosaurs.
10. **F** Everything a person learns using archaeology can be found in history books.
11. **F** A person does not need special training to be an archaeologist.
12. **F** An archaeological survey involves digging up artifacts.

**Part Two:** Please use your knowledge of archaeology to fill in the blanks.

List five (5) tools that archaeologists use: Trowel, Bucket, Dustpan, Brush, Paintbrush, Screen, Clipboard, Papers, Grids, Pencils, Measuring tools, Shovels, others?

1. __________________________
2. __________________________
3. __________________________
4. __________________________
5. __________________________
Artifact Information for Archaeology Boxes

On the following pages a layout of how the artifacts were placed in each box and approximate depth to correspond to the following levels and time periods. Also included is the name of the artifact and total number of artifacts per box. Photos of each artifact used is following each box map.

Not all artifacts are included in the photos.
All artifacts were produced by hand, reproductions, or obtained legally.

It was determined to have two Eastern Woodland boxes because it most represented our area of interest in Michigan.

Pacific Northwest                      Current
Southwest / Plains                      1901 – Current (Plow Zone)
Eastern Woodlands A                    1600 – 1900 (Occupation)
Eastern Woodlands B                    Pre-1600
                                          Ancient
<table>
<thead>
<tr>
<th>Layer</th>
<th>Objects</th>
<th>Size (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>Spoon, Padlock, Toy Soldier</td>
<td>2 (to 3)</td>
</tr>
<tr>
<td>1901 – Current (Plow Zone)</td>
<td>Ice Fishing Weight, Heavy Wire, China</td>
<td>4 (to 7)</td>
</tr>
<tr>
<td>1600 – 1900 Occupation</td>
<td>Square Nails, Buttons, Mandible, Lead Balls/Shot</td>
<td>9 (to 16)</td>
</tr>
<tr>
<td></td>
<td>Skull, Large Animal Knee</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Charred Rock, Partial Mandible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Charcoal, Turkey Bones</td>
<td></td>
</tr>
<tr>
<td>Pre-1600</td>
<td>Totem, Ivory Statues (2)</td>
<td>4 (to 20)</td>
</tr>
<tr>
<td>Ancient</td>
<td>Arrowhead</td>
<td>5 (to 24)</td>
</tr>
</tbody>
</table>

# Artifacts: 22
Box # 1  Name: Pacific Northwest

Current

Toy Soldier

Can Opener

Padlock

Spoon

1901 – Current (Plow Zone)

Heavy Wire

Pottery

Ice Fishing Weight

China
Box # 1  Name: Pacific Northwest

1600 – 1900 (Occupation)

Not pictured:
Turkey Bones
Box # 1  Name: Pacific Northwest

Ancient
(Arrowhead reproductions were obtained from Fort St. Joseph Museum, Niles, Michigan)
<table>
<thead>
<tr>
<th>Box # 2</th>
<th>Name: Southwest / Plains</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current</strong></td>
<td><strong>1901 – Current (Plow Zone)</strong></td>
</tr>
<tr>
<td>Red Bell</td>
<td>Wood Cross</td>
</tr>
<tr>
<td>Toy Truck</td>
<td>Aluminum Bowl</td>
</tr>
<tr>
<td><strong>1600 – 1900 Occupation</strong></td>
<td></td>
</tr>
<tr>
<td>Buttons</td>
<td>Mandible</td>
</tr>
<tr>
<td>Pottery</td>
<td>Pottery</td>
</tr>
<tr>
<td>Charcoal</td>
<td>Metal Cross w/Turquoise</td>
</tr>
<tr>
<td>Pottery</td>
<td>Skull</td>
</tr>
<tr>
<td>Turquoise Large</td>
<td>Bone</td>
</tr>
<tr>
<td><strong>Pre-1600</strong></td>
<td></td>
</tr>
<tr>
<td>Tooth</td>
<td>Turquoise Small / pcs.</td>
</tr>
<tr>
<td><strong>Ancient</strong></td>
<td><strong># artifacts 24</strong></td>
</tr>
<tr>
<td>Arrowhead</td>
<td>Arrowhead</td>
</tr>
</tbody>
</table>

# artifacts: 24
Box # 2  Name:  Southwest / Plains

**Current**

- Wood Cross
- Red Bell
- Pencil Partial

**1901 – Current (Plow Zone)**

- Toy Metal Truck
- Aluminum Bowl
- Nails
Box # 2  
Name: Southwest / Plains

1600 – 1900 (Occupation)

- Metal cross with turquoise
- Turquoise Button
- Skull
- Charcoal
- Lead Shot
- Nails
- Mandible
- Bone
- Pottery Pieces

Southwest/Plains 1600-1900 (Occupation)

Southwest/Plains 1600-1900 (Occupation)

Southwest/Plains 1901-Current (Plow Zone)

Southwest/Plains 1600-1900 (Occupation)

Southwest/Plains 1600-1900 (Occupation)

Southwest/Plains 1600-1900 (Occupation)
Box # 2  Name: Southwest / Plains

**Southwest/Plains Pre-1600**

- Turquoise, plus small broken pieces not shown

**Ancient**

(Arrowhead reproductions were obtained from Fort St. Joseph Museum, Niles, Michigan)
<table>
<thead>
<tr>
<th>Layer</th>
<th>Artifacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>Doll Head, School glue stick, Spartan Phone Case</td>
</tr>
<tr>
<td>1901 – Current</td>
<td>Rocks Railroad, Cement, Nails</td>
</tr>
<tr>
<td>1600 – 1900</td>
<td>Buttons, Mandible, Nails, Lead Shot, Clay Pipe Pieces, Flints – French, Metal Cross, Beads, Lead Seal, China, Charcoal</td>
</tr>
<tr>
<td>Pre-1600</td>
<td>Tinkling Cones, Acorns, Deer Antler, Corn, Turkey Bones</td>
</tr>
<tr>
<td>Ancient</td>
<td>Arrowhead, Arrowhead</td>
</tr>
</tbody>
</table>

# Artifacts
- 25
Box # 3      Name: Eastern Woodlands A

Current

Doll Head

Glue Stick

Phone Case

1901 – Current (Plow Zone)

Rocks Railroad

Cement Burned

1901-Current (Plow Zone)

Phone Case

Cement

Eastern Woodlands A
Current

Eastern Woodlands A
1901-Current (Plow Zone)

Eastern Woodlands A
1901-Current (Plow Zone)
Box # 3  Name: Eastern Woodlands A

1600 – 1900 (Occupation)

- Eastern Woodlands A 1600-1900 (Occupation)
  - Buttons
  - Clay Pipe Pieces
  - Beads

- Eastern Woodlands A 1600-1900 (Occupation)
  - Flints, French
  - Nails
  - Lead Shot
  - Charcoal

- Eastern Woodlands A 1600-1900 (Occupation)
  - Lead Seal
  - Metal Cross

- Eastern Woodlands A 1600-1900 (Occupation)
  - China
  - Beads
Box # 3  Name: Eastern Woodlands A

Pre – 1600

Not pictured: Acorns

Ancient
(Arrowhead reproductions were obtained from Fort St. Joseph Museum, Niles, Michigan)
Box # 4  Name: Eastern Woodlands B

<table>
<thead>
<tr>
<th>Current</th>
<th>Baby Food Jar</th>
<th>Canning Lid</th>
<th>Toy Tires</th>
</tr>
</thead>
<tbody>
<tr>
<td>1901 – Current</td>
<td>Cement</td>
<td>Sauce Pan</td>
<td>Nails</td>
</tr>
<tr>
<td>(Plow Zone)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1600 – 1900</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-1600</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ancient</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># artifacts</td>
<td>24</td>
<td></td>
<td>109</td>
</tr>
</tbody>
</table>

- 2” (to 3”)
- 4” (to 7”)
- 9” (to 16”)
- 4” (to 20”)
- 5” (to 24”)

- China
- Buttons
- Turkey Bones
- Flints – British
- Metal Cross
- Charcoal
- Large Foundation Rocks
- Lead Shot
- Clay Pipe Pieces
- Lead Seal
- Beads
- Tinkling Cones
- Corn
- Acorns
- Mandible
- Deer Antler
- Arrowhead
- Arrowhead
Box # 4      Name:  Eastern Woodlands B

Current

Eastern Woodlands B Current
Baby Food Jar

Eastern Woodlands B Current

Toy Truck Tires

Canning Lid

Pottery
Doll Head
Glue Stick

Rocks
Railroad Nail

Cement
Burned Cement

Baby Food Jar

Not pictured:
Cement

1901 –
Current
(Plow Zone)

Aluminum Saucepan

1901-Current (Plow Zone) Nails

Eastern Woodlands B
1901-Current (Plow Zone)
Box # 4  Name: Eastern Woodlands B

1600 – 1900 (Occupation)

- Buttons
- Clay Pipe Pieces
- Turkey Bones
- China
- Charcoal
- Flints, British
- Lead Shot
- Lead Seal
- Metal Cross
- Tinkling Cones
- Beads
- China, Cup Handle
- China, Lid
- China, Lid

Not pictured:
Large Foundation Rocks
Pre – 1600

Not pictured:
Acorns

Ancient

(Arrowhead reproductions were obtained from
Fort St. Joseph Museum, Niles, Michigan)
A total of 8 boxes were built and used in Lesson 8.

Four (4) boxes were filled with dirt and artifacts; and labeled with a number from 1 to 4. Four (4) more boxes were built (without stratigraphy on the inside walls), and were used to screen all dirt into to keep the dirt confined within the empty boxes.

The dirt boxes were also labeled 1 through 4, as follows, 1D, 2D, 3D, 4D and correspond to each box. Each Group was assigned two boxes, 1 and 1D; 2 and 2D; 3 and 3D; and 4 and 4D.

Supplies for one (1) box:

6  2” x 4” pine boards, treated, 8’ long (4’ will be left over to use on next box)
2  ¾”, 4’ x 8’ exterior grade plywood
136 2” stainless steel screws (this is minimum amount, 1 lb. = ~ 128 screws)
20  3” stainless steel screws (this is minimum amount, 1 lb. = ~ 82 screws)
1  Wood pallet
4  Stainless steel hooks
1  Set of large (recommend 4”) Stencils
1  Set of medium (recommend 3”) Stencils
1 - 2  King Size Permanent Black Markers
Wood stain in the following colors for stratigraphy on walls
(we used Minwax® Wood Finish Penetrating Stain)
- Ebony
- Dark Walnut  2716
- Honey  272
- Red Mahogany  225
- Golden Pecan  245

Exterior grade plywood was used on all boxes for the bottom, sides, and top. Treated 2” x 4” pine boards were used for remainder of the wood for construction.

The use of 2” stainless steel screws is recommended for all, except when constructing the top frame when 3” stainless screws were used.

Overall dimensions:

Bottom of each box is 44" square.  
Top of each box is 48” square.  
Sides, long sides x 2 is 24” x 44”  
Sides, short sides x 2 is 24” x 42 ½“
Overview

This is an example of the finished box without a lid, but has stenciling (notice '3' – on 2 sides) and directions, N=North; S=South; E=East; W=West

This is an example of the box with a lid prior to stenciling, and prior to sealant applied to the top of the lid.

The top of the box is 48” square

Notice the stratigraphy on the inside walls.

The bottom of the box is 44” square
**Step 1:** Using the 2” x 4” boards, rip 4 in half to create 8 - 2” x 2” boards, 8’ long
(Note: 2 - 2” x 4” boards will be left to create ledge on top)

- Cut 4 – 2” x 2” boards to 42-3/8” [Step 3A and 3B]
- Cut 4 – 2” x 2” boards to fit on sides as illustrated below [Step 3C/D] (size may vary)

**Step 2:** Using 4’ x 8’ sheet of exterior grade plywood, cut sides to the following dimensions:

* **Lowe’s® will cut the 4’ x 8’ plywood pieces to size which is extremely helpful**

- 2 short side pieces cut to 42 ½” long x 24” wide

```
+----------------+----------------+
| 42 ½”          | 24”            |
|                 |                |
```

- 2 long side pieces cut to 44” long x 24” wide

```
+----------------+----------------+
| 44”            | 24”            |
|                 |                |
```

**Step 3:** Place the short side (42 ½ “ x 24”) flat then place the 2” x 2” as illustrated.
Using 2” stainless screws, screw into place (~ 4 screws on sides, and ~ 7 screws across the top and bottom. **Make 2 short sides.**
Step 4: Stratigraphy. It is helpful to paint/stain the wood prior to putting the box together. It can be done after the box is together, but you will have to crawl inside the box to do this.

Note that the short sides have already been screwed together with the 2” x 2”, but the long sides have not yet been attached to the short sides.

Below are photos of various levels of stratigraphy prior to putting the box together. Using a permanent felt marker to make rocks prior to staining can be done if desired. The dirt box (labeled ‘D’) does not need to have stratigraphy. Stratigraphy is optional, but does reinforce Lesson 4 on Stratigraphy when using. The use of Minwax® stains were used on the following illustrations to represent changes in soil colors. Use of a Munsell Soil Color Chart can also be used.

Wood stain in the following colors for stratigraphy on walls
(we used Minwax® Wood Finish Penetrating Stain)

- Ebony (Top)
- Dark Walnut  2716
- Honey  272
- Red Mahogany  225
- Golden Pecan  245 (Bottom)
Step 5: Match up the top edge of the 44” x 24” [long side] to the framed 42 ½” x 24” [short side] (**make sure you have the bottoms correctly lined up, especially if you have done the stratigraphy**). Using 2 screws, screw in the top and bottom of one short and one long side together. Then add the other long side, screwing together, and finally the other short side.

- Add a long 2” x 2” to the long side to the top edge, measure/cut to fit.
- Leave a slight 1/8” gap on the long sides so that it lines up with the short sides.
- Invert box and add another long 2” x 2” to the bottom, measure/cut to fit.
- Finish by screwing in additional screws in each section to reinforce.
- Match the outside corners.
Step 6: Cut a 44” square bottom using your ¾” exterior grade plywood. While the box is inverted, square this up to the bottom of the sides and screw in place. Make sure that your box is square prior to setting your screws. 

[Make sure if you have done stratigraphy that you are putting it on ‘the bottom’ of the box.]

Step 7: Invert back to the upright position and add the top frame using a 2” x 4”, matching the 2” x 2” board inside. Measure/cut to fit using 2 long sides and 2 short sides.

- Use 3” stainless steel screws to hold in place. You should use ~ 5 screws per side.

Clamping the 2” x 4” in place is helpful to line it up properly prior to putting the screws in place.

Putting the ledge on the box not only gives it a nice clean look, but gives the students a nice platform to lean against and place their tools.

Your lid should fit nicely within the ledge. Lid instructions begin with Step 8.
Step 8: It is important to make the frame inside the lid to fit loosely inside the top frame and to oversize the actual lid so that it overhangs the edges of the box to keep it as dry as possible.

- Cut a 48” square lid using your ¾” exterior grade plywood.
- Measure the inside of your box to determine position of 2” x 2” boards, and subtract ~ 1-2 inches so lid fits inside the box.

See example on next page on how you can draw a line on your lid to help determine where to place your 2” x 2” frame.
Step 8, continued: Below is an illustration of how the inside of the box was marked on the lid using a pencil. This helps with correct placement of the 2” x 2” boards that will fit inside the box to make a stable lid. Screw 2” x 2” boards into place.

Constructing the lid like this allowed us to turn the lid cock-eyed to allow air to get into the boxes so that moisture or mold was not a problem. Boxes were stored in an open shed at the school with lids cock-eyed and tarps placed on top and secured as illustrated below.
**Sealing the lid against weather**

**Step 9:** Because we used exterior grade plywood (you may want to consider marine plywood, however, it is costly), we wanted to help protect the lid and box from moisture damage, so we applied a spar urethane coating to the top and sides of each lid. We put approximately 3-4 coats of this on each lid.

We used the Minwax® Indoor/Outdoor Helmsman Spar Urethane, Clear Gloss on the archaeology box lids for protection.
Step 10: Drilling drainage holes in the bottom of the box is recommended in case any water collects inside. Drilling the drainage holes can be done at any time, but it is recommended to do them prior to placing the box on the pallet; recommended is at least 3/8” to ½” holes, at least 9 of them.

Step 11: We originally were going to attach each box to a pallet, however, due to the weight of the boxes, we felt it was not necessary and placed the boxes on the pallets without attaching them. We invested in a pallet jack which made moving the boxes around much easier.
**Step 12:** We wanted the students to be able to experience as close as possible a real archaeological dig site, so we placed stainless steel hooks in the corners of the box where they could put in a string to simulate their actual dig site as illustrated below.

Stainless hooks that we squeezed together the hook part slightly using a pair of pliers so that it did not stick out and cause an injury to the students

Above are examples when string was placed in the hooks to simulate an actual archaeological dig site

The stainless hooks were screwed in at each corner, low enough to miss the lid when placed on top
**Step 13:** To incorporate compass directions into the boxes, the directions of N = North, S = South, E = East, and W = West were stenciled on the ledge of the box. 3” stencils were used. A King Size permanent black marker was used to stencil them in.

![Image of a box with stenciled numbers and compass directions.]

**Using a 3” stencil and a King Size permanent marker, N, S, E, W were placed on the appropriate sides of the ledge on the box.**

**Step 14:** Because we had multiple boxes, and one box for dirt (with no stratigraphy) it is recommended that using 4” stencils you label the box on at least 2 sides with a number and the corresponding dirt box with the same number and the letter ‘D’. A King Size permanent black marker was used to stencil them in.

![Images of boxes with stenciled numbers and letters.]

**Above and Right are examples of boxes with stenciled numbers on them.**
We had 8 yards of top dirt (which has not been processed, so it contains roots, sticks, and rocks) delivered to the school. Each box took approximately 2/3 yard of dirt. Artifacts were layered in the boxes with the oldest planted first, and so on. Please see lesson 8 for the dig. Beginning on page 96 contains examples of how the artifacts were placed.

Below are photos of placing the artifacts and the set up prior to students starting the dig.

This is how we set up 4 boxes, the dirt boxes contained the screens, so that the students screened the dirt directly into the empty dirt box.

When empty, or near empty, the boxes also served as a great storage place for their bucket of tools, buckets for dirt, and screens.

Everything was labeled with box numbers that the students were assigned and responsible for.
Students rotated positions between digging, screening, measuring and recording.
Using archaeology to develop strategies that can be used to support state curriculum requirements in science, social studies, language arts, mathematics which include scientific inquiry, problem solving, and higher thinking skills can be achieved. It gives the students a hands-on opportunity that they will remember for many years to come.