

DCM Exhibitions – Staff Training Materials

Solve It! (PART B) [Ancient City Scenario]

Exhibition Particulars:

- The Ancient City exhibition features a wooden table where visitors may use blocks that are themed after ancient architecture to build their own structures.

Component Descriptions:

A. Orientation Video [Location: Exhibition entrance]

This is a brief orientation video that introduces the scene to visitors and explains their role as investigators. Two actors whose characters are based on the context of the scene engage visitors and describe the situation. Visitors learn that they are forensic investigators who are called to the site of a lost city in South America.

Following the video, visitors pick up a copy of the Field Notes to take with them as they explore the exhibition.

Engagements Tools and Tips

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.
- Encourage visitors to watch the 2-3 minute orientation video. Ask them to predict who the person of interest may be, and what happened to the person.
- Distribute the Field Notes and writing utensils to visitors to aid them in their investigation.
- Remind visitors that the Field Note prompts do not need to be followed in a linear fashion; they may solve in any order.
- If visitors opt out of viewing the brief orientation video, staff members may provide a recap of the video content, and assist the visitor with questions related to exhibit content.

[Note: Questions in italics below are “answered” through visitors’ interactions with certain components throughout the exhibition. Questions appear in Field Notes and in area labels.]

B. *What type of Structure was this?* [Location: Excavation site]

Artifact sorting

Visitors sift through loose material in the dig pit to find various objects related to the scene: pottery shards, gold coins, turquoise beads and yellow rocks. The pottery shards are pictured on a timeline with other shards from different eras. Visitors will match their recently collected artifacts with the timeline

coin photos to determine their place in history. The visitors will then deduce what era the coins represent and circle one of the possible answers on the field notes.

Tunnel symbol identification

These two activities highlight different ways of determining when objects were in use and, therefore, understanding when a particular site was “active” or populated.

Visitors can crawl through a tunnel-like space underneath the Ancient structure to the Evidence sorting area, or vice versa. Inside, they’ll discover an image related to the overall scene. They can draw a sketch of what they see in their Field Notes. The activity helps illustrate the idea that investigators need to look *everywhere* for clues because they’re not always out in the open.

Engagement Tools and Tips

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.
- Encourage visitors to explore the Excavation Station. Ask visitors to describe properties of the artifacts they discovered.

Stratigraphy is the study of layers in the earth. Layers that are farther away from the earth’s surface are older than layers closer to the surface. When objects are found in different layers of the earth, the position of the layer provides information about when objects were left there.

Visitors match the pottery shards they’ve found to images of objects in the stratigraphy chart. They circle the time period of the mining tags in their Field Notes. This answer, together with the one from Evidence Dating, can be used to answer the question: *When was this site active?* The overlap between the two sets of dates is the correct answer.

[Location: Crawl Space beneath Ancient Structure]

C. *What evidence is found here?* [Location: Supply Warehouse]

Evidence Sorting

Visitors sift through loose material in the dig pit to find various objects related to the scene: Gold coins, pottery shards, turquoise beads and yellow rocks. Visitors then sort the objects into different containers and determine which object is found in the greatest quantity. This is another method of organizing and analyzing the evidence that is gathered. Investigators can theorize about the purpose or function of a place based on objects found there in large quantities.

Engagement Tools and Tips

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.
- Use fossil, rock, bone, and mineral displays to encourage further exploration of archaeology, geology, and geography concepts.

D. What is this material? [Location: Ancient Structure]Density Calculation

Density is the amount of material (mass) in a certain space (volume). Even when objects are about the same size, they can have different densities. By determining the density of a material, investigators learn more about what a substance could be and how it fits into the scene or time period.

Visitors bring yellowish rocks from the Dig Pit to this station and determine their density by following a four-step process: find the mass, measure volume without rocks, measure volume with rocks, solve the equation. Visitors weigh the rocks and then measure their volume through a displacement method using sand in a container. Using their data, visitors solve the equation ($\text{mass} \div \text{volume} = \text{density}$) and determine whether the material is pyrite or gold. They circle the answer on their Field Notes.

Engagement Tools and Tips

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.
- Ask visitors to collect the “shiny” rocks. Compare and contrast the properties of gold and pyrite.
- Use supporting written materials to further explore and discuss concepts of mass, volume, and density.
- Use the periodic table of elements to illustrate different densities between substances.
- Compare and contrast the properties of a sponge and countertop material. Ask visitors what differences they notice between the two materials, and what they think might be happening at the molecular level.

E. What is this mysterious object? [Location: Hidden Chamber]

Within the Hidden Chamber there is a “mysterious” object encased in glass. Archaeologists are trying to determine what the object was used for by the ancient natives. Visitors will notice iconographic designs on the object and may begin to **hypothesize** the use of the object. Adjacent to the mysterious object are three panels that have indentions of symbols upon them. Visitors may use the paper and crayons located next to the panels to make a crayon rubbing of the symbols. After the rubbings are complete, the visitors may use one of the lab computers to decode the symbols and write their meanings in their field notes, thereby ascertaining the true purpose of the mysterious object.

Decoding

Visitors scan the object for symbols and sketch what they find in their Field Notes. Using one of the general Lab Station touch-screen computers, visitors access the “decoding” function to learn what the symbols represent and record the information in their Field Notes.

Engagement Tools and Tips

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.

- Encourage visitors to explore the mysterious symbols. Discuss the possible meanings of the ancient symbols.

F. Tools for imaging used by Archaeologists

- Sonar: A method for detecting and locating objects under the ground or under water by means of sound waves. The sound waves are sent out by a device and reflected by any objects that they reach. Those reflections reveal the size and shape of the objects.
- Magnetometry: A method used to detect the presence of a metallic object or to measure the strength of a magnetic field. Modern technologies such as magnetometry allow investigators to look underground without having to dig anything up. Since natural materials like rocks, minerals, and soil have varying degrees of magnetism, a magnetometer can measure these differences and produce a picture of what lies beneath the surface. This is helpful in locating buried objects, but also in seeing man-made features such as trenches, walls, or graves. Historical activities like burning also leave magnetic traces that can be detected.
- Videography: The process of capturing moving images on electronic media (like direct-to-disk recording, streaming media, etc.).

Object Identification

Visitors use the joystick to view four objects in the collapsed tunnel and make sketches of each in their Field Notes. Using the Lab Station computer for “object identification” in the Lab area, visitors research the objects they’ve sketched and write the names of the objects in their Field Notes.

Engagement Tools and Tips

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.
- Encourage visitors to discuss different techniques of viewing buried formations.

G. *What was this place?*

[Locations: Collapsed Tunnel, Tiwanaku, Bolivia (collapsed tunnel – no entry)]

Artifacts Identification

Visitors see artifacts inside the collapsed tunnel and compare them to the samples below the label for this activity. If they see something that matches what they saw in the collapsed tunnel, they circle the name of the mineral in their Field Notes. When investigators can identify a particular mineral at a site, it helps to fill in the blanks about the significance of the site, or how the site might have been used.

Engagement Tools and Tips

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.

- Encourage visitors to make sketches of the objects found in the collapsed tunnel. Once completed, direct visitors to the identification station in the laboratory to process their results.

H. **Who was this person?** [Location: Lab in central area]

All the activities that are connected to this question are found in the Lab, in the central area of the exhibition. The bone-testing activities are on one side of the Lab and four touch-screen computers are on the opposite side: two are general, two are specific (“DNA” database and “object identification” database).

Bone Identification

The remains of animals can also provide important information to investigators. Visitors examine bones to determine which ones are human and which ones are animal bones. After matching the bones with one of the images, visitors make an identification and write it in their Field Notes.

Gender

Visitors compare a pelvis bone to a chart to determine whether the pelvis is from a man or a woman, and circle the correct answer in their Field Notes. Visitors may also observe an anatomical model of a male skull. Male skulls tend to be thicker and heavier than female skulls, and their facial bones are more pronounced. Male skulls typically possess a pronounced forehead ridge that is mostly absent in females. These are general observations, of course with humans, diversity in bone structure is prevalent and observational traits can sometimes be misleading.



(Left: Male. Right: Female Note: these images have been provided by Dr. Douglas Ousterhout. Images from the S.R. Atkinson Collection of Human Skulls, University of the Pacific School of Dentistry, Webster Street, San Francisco, California).

Age

The label at this activity provides information about bone density and its relationship to a person’s age. Visitors use the chart within the label to determine the age range of the mystery person and circle it in their Field Notes.

Height

Completing this activity enables the visitor to learn the approximate height of the mystery person. Visitors measure the length of the femur, enter it into an equation on their Field Notes, and solve.

Cause of Death

Visitors compare the skull in the Lab with images on the label to determine how the skull was damaged, and what the likely cause of death was.

Engagement Tools and Tips

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.

- Use products from the retail store that correlate with the Solve It experience.
- Encourage guests to observe sketches and bone models in the Laboratory. Promote the sharing of ideas between guests.
- Offer the disarticulated skeleton and skull model for further exploration.

I. File a Final Report [Location: Any general Lab Station touchscreen computer]

When visitors have answered all the questions on the Field Notes sheet, they may go to any general Lab Station and file their “final reports” to see if they interpreted all the evidence correctly. Feedback is provided if certain answers were incorrect or inconsistent with other evidence.

Engagement Tools and Tips

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.
- Direct visitors to a Lab station for submission of their Field Notes. Demonstrate where the “Final Reports” icon is located, and encourage visitors to input their Field Note answers.

J. Careers: *What is an Archaeologist?* [Location: Left of exhibition exit, adjacent to Lab]

As visitors leave the exhibition, they’ll see a large panel to their left with the heading: *What is an Archaeology?* This panel features pictures of investigators in the field and highlights four different aspects of their work: fact finders, mystery solvers, team players and education experts. The panel is designed to help visitors connect the activities in *Solve It!* to real-world occupations and to help support further discussion outside the Museum.

Engagement Tools and Tips:

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.
- Ask visitors what career looks the most interesting to them and why. Show them what areas of the exhibit they might enjoy based on their responses.

K. Demonstration Desk [Location: Adjacent to *What is an Investigator?* panel]

The Demonstration desk is a place specifically designed for gallery programming. It is located at the entrance to Solve It near the Hurricane Exhibit, to entice visitors to explore the gallery space that is not clearly visible. Museum staff members are encouraged to frequent the demonstration desk area dressed in “investigative” wear to attract the attention of visitors. The desk serves as an area for ongoing demonstrations, and exploration of relatable gallery materials such as minerals, bones, or fossils. These materials are located within the Solve It support room and may be utilized as tools for engagement and inquiry based interactions.

Engagement Tools and Tips:

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.

- Display various specimens on top of the desk and provide visitors with magnifying glasses, paper and pencils so that they can make and record observations based on what they see and feel.
- Display ecosystem puzzles so visitors can sort plants and animals into their appropriate habitats. Discuss what the plants and animals have in common, and discover their differences together.
- Display different minerals on the desk and provide visitors with magnifying glasses, paper and pencils so that they can make and record observations based on what they see and feel. Provide a piece of glass so that they can test the hardness of the minerals. Ask visitors what they think the name of the mineral may be, or what they would name it based on its physical properties.
- Between facilitated programs, temporary signage and materials are placed in the Demonstration Desk area, to encourage inquiry based learning interactions between staff members and visitors. The Demonstration Desk materials align with the gallery theme, and are carefully selected to enhance the process of hands-on exploration.

L. Block Measuring [Location: adjacent to the block table]

Visitors are encouraged to measure the lengths of the blocks to determine what civilization created them. An information panel on the wall behind the block table allows visitors to compare their results before recording the answer on their Field Notes.

Engagement Tools and Tips:

- Use laminated Conversation Cards to facilitate an inquiry-based approach to learning.
- Use products from the retail store that correlate with the Solve It experience.
- Ask visitors how they think people may have measured objects before the ruler was invented.