

Enhancing Visitor Interpretation at the Walthamstow Pumphouse Museum

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Enhancing Visitor Interpretation at the Walthamstow Pumphouse Museum

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Abstract

The goal of this project was to assist the Walthamstow Pumphouse Museum develop new approaches to interpretation that enhance visitor engagement. We conducted visitor surveys to understand opinions on the materials at the museum. We interviewed museum staff to understand the best practices in visitor interpretation. We developed prototype materials that could be used in future interpretation methods and received volunteer feedback. Visitors and volunteers suggested many improvements besides new interpretive materials but emphasized that changes should not detract from charm of the museum. We recommend that the Walthamstow Pumphouse Museum create a learning hierarchy and master plan for future developments and incorporate a diverse range of interpretive devices throughout the museum.

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Executive Summary

Education is a fundamental part of the mission of museums around the world, and a major reason why members of the public visit museums. In a recent study conducted by the Audience Agency, 55% of visitors stated that education was one of their leading motivations to attend a museum (Audience Agency, 2018, p. 8). In recent years, however, the way in which museums approach education has shifted. Museums have moved away from didactic approaches, in which visitors are seen as empty vessels to be given information, and have instead taken on a constructivist approach, in which the visitors build upon prior knowledge and become the leaders of their own learning. With this change, museums have shifted to more innovative and dynamic approaches in their interpretation.

Methods

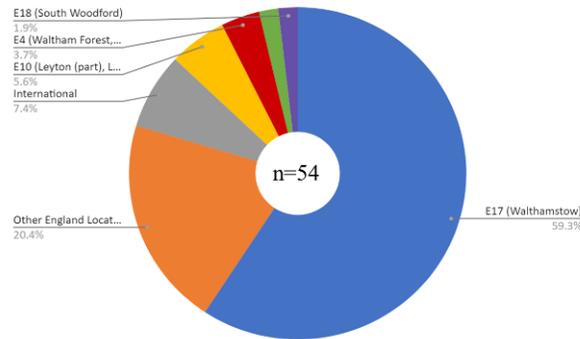
The goal of this project was to assist the Walthamstow Pumphouse Museum in developing innovative approaches to interpretation that are more **appealing, accessible, informative, and engaging** for its target audiences. To accomplish this goal, we used a mixed methods approach, including: (1) conducting observations and staff interviews at the Pumphouse Museum and other museums throughout London to understand the current and best practices in museum interpretation; (2) gathering and organizing archival materials and oral histories from museum volunteers and community members to be used as supplemental materials; (3) surveying visitors to determine their perspectives on current and potential approaches to exhibits and interpretation; (4) developing prototype interpretive materials and solicited feedback on them through focus groups and discussions with museum staff.

Findings and Analysis

Our observations and interviews at other museums in London revealed five best practices: (1) include a mix of interpretive devices to accommodate different learning styles; (2) highlight key items in an exhibit using eye-catching text and bold graphics; (3) use bold synopses with more detailed descriptions for interested readers; (4) develop a learning hierarchy when creating exhibits for visitors; (5) develop a master plan for the museum to follow so they can organize their plans for the future.

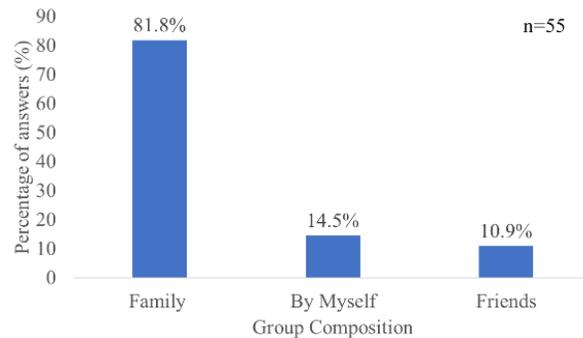
Our observations at the Pumphouse Museum revealed that the museum relies heavily on text panels in the Pumphouse and the Tube Carriages areas, whereas the Fire Station relies more on guided tours by volunteers. Volunteers said they would like to see more in-depth information in addition to improvements in how the text panels are formatted.

The visitor surveys reinforced that the museum is an integral part of the community. The majority (**59.3%**) of visitors were from the local area (ES1).



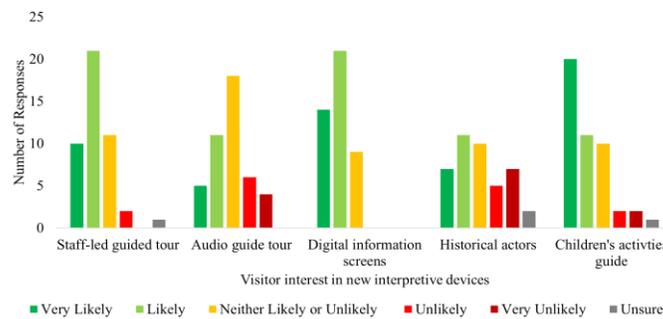
ES1: The origins of visitors to the Walthamstow Pumphouse Museum (n = 54)

81.8% of respondents said they **attended the museum with their family** (ES2).



ES2: Group composition of respondents (n=55)

Finally, **most visitors** said they would be **likely** or **very likely** to use new interpretative approaches at the museum, such as staff-led guided tours, digital information screens, and children’s activities guides (ES3).



ES3: Visitor interest in new interpretive devices at the museum (n=46)

Utilizing our findings, we developed two prototype interpretive devices. These are redesigned text panels (Appendix K) and a children's activity guide (Appendix L) that could serve as starting points for future development. We conducted a focus group with volunteers at the Pumphouse Museum to solicit feedback about these prototypes.

Participants indicated that the current text panels need refreshing and improving. They noted that current panels lacked uniformity and appeared unprofessional. Participants were concerned that the prototyped panels were too simple to appeal to adults, and that some of the information became lost. Most of the feedback focused more on the content and wording, and on inaccuracies that may be present in the original text, rather than the design and layout.

During the testing for our survey, we noticed most visitor groups that come to the museum are families. Thus, we developed two different prototypes of a children's guide for discussion. We learned that a children's guide was something the museum staff has wanted to offer for a long time. Participants loved the concept because it would **boost engagement** and **interpretation** for children and families. They noted that the prototype guides needed more personality, and the text was too simple and would likely only be effective for very young children.

Conclusions and Recommendations

Based on our findings, we learned about the museum's community, the improvements the volunteers and visitors would like to see, the best practices in museum interpretation, and the materials that could be incorporated into the Pumphouse Museum. Our survey responses and interviews suggest that although members of the community want to see improvements in the museum, they also want the museum to maintain its unique personality. Our recommendations incorporate working to improve visitor interpretation while **maintaining the community spirit**. Our recommendations are:

- 1. Develop a master plan and learning hierarchy.*
- 2. Incorporate archival materials in reinterpretation efforts.*
- 3. Modify and add various interpretation devices.*

Develop a Master Plan and Learning Hierarchy

From our interviews, we learned that many museums develop master plans to guide their exhibit design and interpretation. Identifying a learning hierarchy for exhibits is a central part of any master plan. *We recommend the museum develop a master plan to guide the future design and installation of exhibits and interpretative approaches. The master plan should identify the hierarchy of learning outcomes for the different galleries and exhibits with input from volunteers and members of the community.*

Unlike larger museums, the Pumphouse Museum is very much a community museum that has developed its own quirky charm. *To maintain this charm and appeal to local residents, we recommend that future developments for the museum involve close collaboration with members of the community.*

Incorporate Archival Materials

Visitors indicated that a historical timeline and narrative would aid their comprehension of the exhibits. Volunteers suggested that the interpretive materials use more graphic elements that are clearly related to the exhibits and are developed following uniform design guidelines. *We recommend that the museum further review the London Metropolitan Archives, National Archives, and Vestry House Museum Archives, to identify graphic materials (such as maps and photographs) that could be used in the reinterpretation efforts.*

Modify and Add Interpretive Devices

Our following suggestions relate to updating and adding interpretive devices to the Pumphouse Museum to enhance the visitor experience and understanding. *We recommend interpretive devices be incorporated or updated including the text panels, a children's activities guide, staff-led tours, an oral history device, and interactives.*

We recommend that the text panels at the museum should be updated in the areas of content presentation and accessibility. Text panels were remodeled following the advice of the British Museum and the Natural History Museum (ES4).

Our surveys and observations revealed that a majority of visitors come to the Pumphouse Museum with their families, especially families with younger children. We developed prototype children’s activity guides that volunteers and visitors expressed great interest in. *We recommend that the museum incorporate the use of children’s activities guides for their visitors with the prototypes serving as starting points for development.*

Current Text Panels	Prototype Text Panels
<p>The area now occupied by the Pumphouse once formed part of Low Hall Farm, which took its name from the nearby Low Hall Manor, a 14th century moated country house. Nothing now remains above ground of the manor house, nor of the 17th century building that succeeded it. Both were destroyed by a V1 flying bomb in 1944. A full-size model of a V1, also known as the FZG 76, can be seen above your head.</p>	<p>The Story of the Land: Low Hall Farm</p> <p>Did you know that the area you are in right now used to be farmland?</p> <p>The land in which the Pumphouse stands was once a part of Low Hall Farm and Manor in mediaeval times.</p> <p>The area of the Pumphouse once formed part of Low Hall Farm, which took its name from the nearby Low Hall Manor, a 14th century moated country house. In Mediaeval times, Low Hall manor and farm land were considered demesne lands, meaning they were lands that were managed by the lord of the manor. Over the years, ownership of the land was changed multiple times. Walthamstow Urban District Council was able to obtain the land in 1877 from the Bosanquet family who were the lords of the Low Hall manor at the time.</p>

ES4: Current and Prototype Text Panels

Having a variety of interpretive devices (e.g. staff-led interpretation, self-paced interpretive devices) allows for the accessibility of the visitors of different learning types. Volunteers highlighted that there are transcripts for a guided tour of the museum’s Fire Station, the only area that currently has a tour. *We recommend that the museum should develop a formal script for the Fire Station area using these recordings as well as a script for a guided tour of the entire museum.*

Many of the volunteers expressed an interest in a device that allowed visitors to hear oral histories forming a greater connection between the visitors and the history. *We recommend the museum reinstate a device for visitors and incorporate new oral histories.*

Lastly, during the surveys, visitors expressed interest in the addition of interactive devices throughout the museum, with a primary focus for an addition of devices in the Fire Station. Interpretive devices allow for a more hands-on learning experience which can be great for children and families alike. *We recommend that the museum incorporate more interactive devices starting with the addition of materials in the Fire Station.*

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Introduction

Education is a fundamental part of the mission of most museums in the UK and around the world, and it is a major reason why members of the public visit museums. For example, in a recent study conducted in the UK by the Audience Agency, 55% of visitors stated that education was one of their leading motivations to attend a museum (Audience Agency, 2018, p. 8). In recent years, however, the way in which museums approach education has shifted. Museums have moved away from didactic approaches, in which visitors are seen as empty vessels to be filled with information, and have instead taken on a more constructivist approach, in which the visitors build upon their own prior knowledge and become the leaders of their own learning. With this change, museums have moved away from static exhibits and text panels to more innovative and dynamic approaches to museum interpretation that allow visitors to interact physically and mentally with the material being presented. These changes have furthered the mission of museums to provide meaningful and educational experiences for their visitors.

Like other museums, the Walthamstow Pumphouse Museum maintains a collection, conducts research, and constantly strives to create an engaging educational environment for its visitors. They currently serve the Waltham Forest community by educating museum visitors on the Pumphouse's rich history and its role in the community. The museum's ongoing efforts are to improve the visitor experience by exploring how to make the interpretation of its collection and exhibits more engaging. Currently, the museum uses text panels as a primary method to interpret the exhibits, but they are looking to adopt more dynamic and effective approaches to interpretation in the future.

The goal of this project was to assist the Walthamstow Pumphouse Museum in developing innovative approaches to interpretations that are more appealing, accessible, informative, and engaging for its target audiences. To achieve the goal of this project, we identified the following four objectives:

- **Objective 1:** Identify best practices in exhibit interpretation, including the use of digital displays, guided and self-guided tours, audio/visuals, and hands-on interactives.
- **Objective 2:** Gather and collate archival and other interpretive materials on all aspects of the museum collection.
- **Objective 3:** Evaluate the demographics, interests, preferences, and behaviors of visitors to the Pumphouse Museum.

- **Objective 4:** Solicit feedback from Pumphouse staff and volunteers about possible interpretive approaches and materials.

To accomplish the goal of this project and meet its objectives, we conducted observational research and interviews to determine the best approaches to museum interpretation. We also conducted archival research to locate material that could be integrated into museum exhibits at the Pumphouse and surveyed visitors of the museum to learn more about what they would like to see to enhance their experience. Finally, building on the findings from Objective 1 and Objective 2, we developed preliminary interpretive materials for the Pumphouse Museum, and we conducted a focus group with staff and volunteers to gather feedback on the materials.

Background

In this section, we will begin by exploring the goals of museums, how visitors learn within museums, and the importance of visitor demographics. Next, we will discuss how other museums approach their methods of interpretation and interpretive devices museums currently use. Finally, we will look at the Walthamstow Pumphouse Museum and discuss its background and the current state of its exhibits as well as analyze previously collected visitor survey data.

1. Goals of Museums

The International Council of Museums defines a museum as a “not-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability” (ICOM, 2022). Most museums identify three main goals: maintaining collections, conducting and/or enabling research, and educating the public through exhibits, programs, activities, and outreach (ICOM, 2022).

In a study performed by Carol Scott, patrons of the Powerhouse in Sydney, Australia, described museums as: “educational,” “places of discovery,” “intellectual experiences,” “challenging,” “places where you can touch the past,” and “good places to take the family” (Scott, 2000, p. 37). Generally, when people visit museums, they interact most with the exhibits that interest them or their children. In doing this, they actively and passively absorb information and learn things about themselves and the world around them according to the type of museum and the nature of its collections. Museums strive constantly to give back to their patrons and the local community by researching ways to improve audience experiences (Scott, 2000, p. 37).

2. Learning in Museums

Museums have always followed the mission of providing visitors with meaningful and memorable experiences, and for this to occur, the visitors of the museums need to be able to interpret and learn from the information presented in each exhibit. When working to understand how visitors learn from museums, one must first consider how the definition of learning in

museums has changed over time, what the current interpretive methods used by museums are, and how to evaluate the effectiveness of the interpretive devices in use.

2.1. The Evolution of Learning in Museums

A large shift in the focus of museums occurred in the 1960s to the 1970s, when museums were looked at less as institutions that displayed collections of objects (i.e, ‘cabinets of curiosities’) and more as educational centers (Graf & Noschka-Roos, 2009, p. 12). This movement has been described as a shift from didactic approaches, where participants are given information through static text panels, to constructivism, where visitors are encouraged to explore and construct their own knowledge and understanding (Long et al., 2022, p. 50:2).

Museums were originally seen as protectors of their collections; however, with this change in approaches to learning, museums began to focus more on helping their visitors learn and less on solely preserving their exhibits (Graf & Noschka-Roos, 2009, p. 13). The Institute for Museum Research in Germany explains that museums have worked to improve visitor learning by developing more interactive exhibits and novel interpretive approaches that integrate new media (Graf & Noschka-Roos, 2009, p. 13). Whereas the Institute for Museum Research describes data collected from German museums, similar changes can be seen globally. For example, the Exploratorium in California experienced its own shift moving away from what was described as “planned discoveries,” in which visitors found static exhibits with text explaining the scientific principle being shown, to an approach that encompassed the idea of active prolonged engagement (Humphrey & Gutwill, 2016, p. ii).

2.2. The Constructivism Approach

Museums shifted from the didactic to the constructivist approach of teaching and learning when they realized that their visitors have different levels of knowledge, learning styles, backgrounds, and interests. The constructivism approach places an emphasis on the fact that each visitor has a level of primary knowledge when entering the museum rather than being blank slates (Jeffery-Clay, 2015, p. 3). Constructivism compares the process of learning to construction in the sense that as visitors acquire knowledge, they are building on top of what they already know (Fox, 2001, p. 23). The constructivist approach encourages visitors to make connections

between their pre-existing knowledge and new knowledge to foster a more meaningful sense of learning (Jeffery-Clay, 2015, p. 3).

2.3. Evaluating Visitor Interpretation and Engagement in Museums

Museums use different approaches to evaluate visitor experiences and develop exhibits, activities, and programs that encourage more meaningful learning. Museums use front-end, formative, summative, and remedial evaluation (Figure 1) to design and evaluate exhibits and their associated interpretive materials (Screven, 1990, p. 37). Front-end evaluation is used to determine visitor knowledge, interests, learning styles, and motivations in planning exhibits (Screven, 1990, p. 38). Formative evaluation is used to design and test prototype exhibit elements and interpretive approaches in an iterative process prior to final development (Screven, 1990, p. 41). Summative evaluation is used to gauge the effectiveness of the exhibit and interpretive approaches after installation (Screven, 1990, p. 52). Remedial evaluation is used to determine how to “fix” the exhibit and interpretive materials to make them more effective in achieving the learning outcomes (Screven, 1990, p. 53). The methods that museums use to obtain information from visitors in all of the stages include interviews, informal conversations, visitor observations and tracking, and questionnaires (Screven, 1990, p. 37).

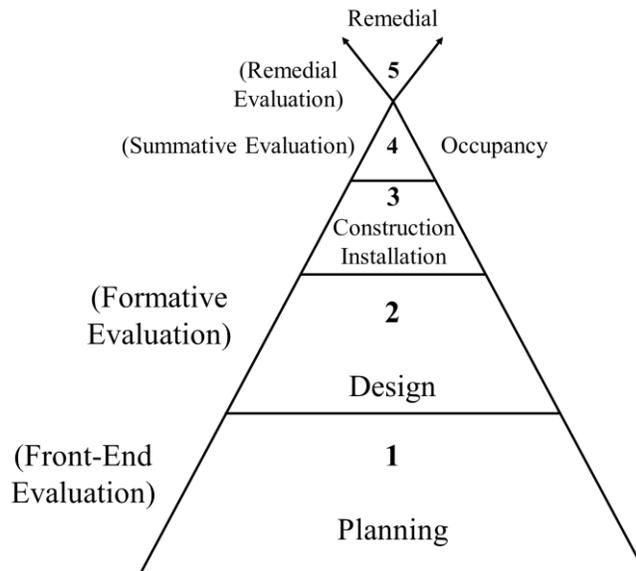


Figure 1: The five stages of exhibit development and subsequent forms of evaluation.

Modified from (Screven, 1990, p. 37).

3. Visitor Demographics and Motivations

For a museum to provide a meaningful experience for their patrons, they must understand who their visitors are and what they want from the museum. In “Audience research and the museum experience as social practice” from the journal of *Museum Management and Curatorship*, Kevin Coffee discusses how visitor research is an integral part of understanding how to improve museum experiences, especially through conducting interviews and performing observations. Coffee (2007) says that observing how patrons and their families interact with museum exhibits and each other can give wonderful insight as to what may or may not work for their audience (p. 382).

Yalowitz & Bronnenkant (2009) describe two main behaviors that should be observed when tracking visitors. The first are stopping behaviors (i.e., what exhibits visitors engage with and for how long), and the second set of behaviors are the social interactions and the paths that patrons follow through the building (Yalowitz & Bronnenkant, 2009, pp. 49-50). Many of the observed behaviors reflect visitors’ interests. Understanding the interests of visitors through surveys and the interactions between visitors can provide a greater insight into visitor motivations. Falk (2008) explains visitors can be categorized in different ways according to their behavior in the museum (p. 27). He distinguishes between explorers, facilitators, professionals/hobbyists, experience seekers, and spiritual pilgrims (Falk, 2008, p. 30). These distinctions provide insight into the motivations of people who attend museums (Falk, 2008, p. 30).

There are multiple reasons why visitors attend museums, and different sources characterize these motivations in different ways. The Audience Agency, a British charity, has identified a range of reasons why people visit museums from seeking relaxation to entertainment, as seen in Figure 2 (Audience Agency, 2018, p. 8). In contrast, the Weatherspoon Art Museum identified a different set of motivators, including curiosity, interest in the museum, word of mouth, and inspiration (Cotter et. al., 2022, p. 281). However, in both surveys intellectual curiosity served as primary motivator (Cotter et. al., 2022, p. 281; Audience Agency, 2018, p. 8). In fact, the Audience Agency found that across all age groups, ranging from sixteen to sixty-five

plus, at least 55% of visitors said one of their motivations for attending was education (Audience Agency, 2018, p. 8).

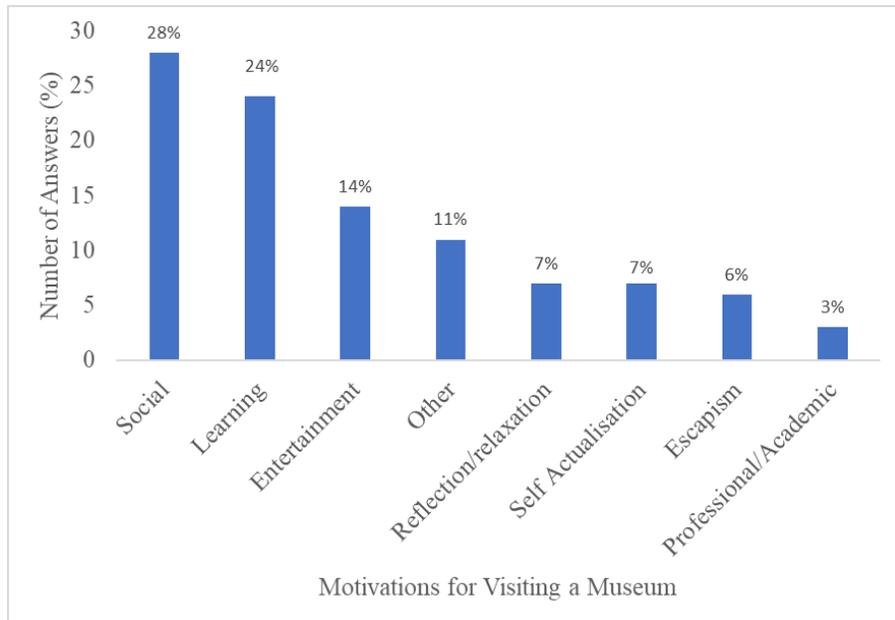


Figure 2: The motivations of visitors to attend a museum. Created with data from (Audience Agency, 2018, p. 8).

Education is not the only reason visitors attend museums. The Audience Agency found that 22% of attendees indicated spending quality time with family and friends was their primary motivation for attending (Audience Agency, 2018, p. 8). While people want to attend museums for educational purposes, social aspects are also important and can affect how people engage with and interpret the exhibits (Mullens & Glorieux, 2019, p. 246). To create meaningful and engaging experiences for their visitors, museums need to take these motivations into account.

As important as they are, social interactions can also inhibit museum attendance. A study from 2019 found the different types of constraints that prohibit people from attending museums include: intrapersonal, interpersonal, and structural (Mullens & Glorieux, 2019, p. 246). Of the different constraint types, museums tend to focus on the structural ones, as these can be most easily addressed by museum staff. Structural constraints include cost of entry and limited hours of operation (Mullens & Glorieux, 2019, p. 246). These can be more directly addressed by the museum, as they are able to increase operation hours and decrease the entry cost.

Intrapersonal constraints include health issues, lack of interest, and stress (Mullens & Glorieux, 2019, p. 246). A German study found that financial insecurity, language barriers, and time constraints discouraged visitors from attending a museum (Kluge-Pinsker & Stauffer, 2021, p. 65). The researchers also found that there were emotional barriers including self-perception and depreciation (Kluge-Pinsker & Stauffer, 2021, p. 65). Increasingly, museums are developing extensive websites that allow virtual tours, online research, and activities that may address intrapersonal constraints and make the exhibits and collections available to wider audiences.

4. Research Findings on Museum Interpretation

Once the demographics and motivations of the visitors of a museum are understood, the museum can begin to determine the interpretation techniques that could most benefit their audiences. Interpretation techniques and the idea of interpretation in museums have changed over time. They have evolved rapidly in recent years in response to events like the COVID-19 pandemic, which led to the removal of tactile exhibits, and the Black Lives Matter movement, which has led to reappraisals of how museums address controversial topics (McKew, 2022, p. 4).

The goal of interpretation for museums, however, has remained constant in the sense that museums have always strived to help their audiences obtain a meaningful learning experience from the material presented (Gross & Zimmerman, 2002, p. 265). Museums strive to keep up with the modern approaches to interpretation that encourage visitors to engage with exhibits and expand on their personal knowledge and experiences (Woods, 1990, p. 77). Museum professionals understand that every person does not learn in the same way, thus they strive to incorporate a variety of different types of interpretive approaches to appeal to a wide range of audiences (McKew, 2022, p. 5). This range of interpretive devices includes text panels to digital interfaces to guided tours.

In choosing interpretive devices and media, museums should consider the main messages they wish to convey, as well as the needs and wants of their visitors (McKew, 2022, p. 6). For example, in choosing text panels, the staff must consider aesthetic appeal, the clarity of the text in describing the exhibit, and the brevity of the information (McKew, 2022, p. 12). Modern technologies, such as QR codes, touch screen panels, apps, audio and visual (AV) presentations, and more are being used increasingly for museum interpretation (McKew, 2022, pp. 10-11).

Prior to deciding on any specific interpretation devices that should be used, museums should first understand the needs and wants of their audience and design the media necessary to provide visitors with the most beneficial and educational experience they can have.

4.1. Interpretive Approaches and their Influence on Visitor Interaction

Visitors learn and interpret information differently depending on whether the information is presented in a self-paced or interpreter-led fashion. Self-paced interpretive approaches include text panels, audio guides, and digital displays. These techniques allow visitors to lead themselves through the museum and learn at their own pace. Interpreter-led approaches involve the help of museum staff members or volunteers to guide a visitor's route, pace, and learning. Each of these interpretive methods has its own strengths and limitations, and museums must find the right balance to engage and educate their visitors effectively. With the use of these methods, museums can continue to provide engaging and informative experiences for visitors of all ages and backgrounds.

Text Panels

Text panels are one of the oldest forms of interpretive devices found in museums today that guide their readers through the exhibits in the museum. There are a few crucial steps in designing effective text panels. First, text panels should be designed to meet the needs and knowledge level of their audience (Gallery Text at the V&A: A Ten Point Guide, 2013, p. 3). Text panels should be concise, be contextualized in terms of the exhibit, and become increasingly more detailed (Gallery Text at the V&A: A Ten Point Guide, 2013, p. 8). The British Museum (2022) states that text should be used to supplement the exhibit as a whole and should appeal to the other senses that visitors experience in addition to sight (p. 15). The British Museum provides some advice to follow while creating appealing and effective text panels: (1) tell a story that connects to the main theme of the exhibit, (2) avoid technical terms that will confuse the audience; (3) grab the audience's attention with concise, compelling text but ensure the description explains clearly what the curator wants the visitor to know; and (4) make text that focuses on people to ensure a human connection (British Museum, 2022, p. 15).

If designed effectively, text panels can enhance the learning experience of visitors. For example, one study at the Australian Museum used a pre- and post-intervention strategy to

evaluate the comprehension of visitors (Ravelli, 1996, p. 383). This study found that 11.4% more visitors answered the comprehension questions correctly after viewing the newer text panel, which was more concise and easier to read, and 60.5% of visitors stated that they preferred to read the newer text panels rather than the older ones because they perceived the text as simpler to read (Ravelli, 1996, p. 383). Hall et al. (2020) found that visitors related more positively to communications on signs with narrative structure and emotional content than other forms of text (p. 31). One study at the Kanha Tiger Reserve found that maps, dioramas, and photographs of tigers were preferred over sections of text describing the animals, highlighting the importance of visual learning (Benton & Sinha, 2011, p. 78). Overall, the research indicates that visitors prefer more engaging and visually appealing interpretation devices to plain text panels (Hall et al., 2020, p. 31).

Digital Interactives

Digital interactives, or exhibits designed with interactivity through a multitouch device, are beneficial in aiding visitor engagement and interpretation (Horn et al., 2020, p. 557). Digital interactives and displays allow for more creative methods of data visualization and exploration (Hinrichs et al., 2008, p. 1181). Digital interactives allow visitors to interact with the visualization before they decide whether they want to dig deeper into the content for greater interpretation (Hinrichs et al., 2008, p. 1182). Visitors can investigate and examine the content from different perspectives in ways that were not possible prior to the development of digital interfaces. Furthermore, digital technologies enable museums to create interactive exhibits and games.

Digital games encourage visitors to engage with exhibits more collaboratively and promote social activity within the museum setting (Horn et al., 2012, pp. 2065-2066). This lengthens visitor engagement and enhances visitor learning. Nevertheless, museums must understand the needs of the audience of a museum when deciding whether to include digital interfaces. In the context of a family group, the adults might be less likely to use a touch screen in an exhibit as they may perceive the interpretive device as being designed for children (Horn et al., 2020, p. 2066). Children on the other hand are drawn more to touch screens and choose to interact more consistently with them than adults, which may draw more adult guardians into the

exhibit (Horn et al., 2020, p. 2066). By using digital interactives as interpretive devices, museums can enhance visitor engagement and learning.

Self- and Interpreter-Led Guides

Visitors can choose whether they would like to lead themselves through the museum by using maps, audio guides, and self-guided tours, or if they would prefer to be led through the museum by a staff member or volunteer in an interpreter-led tour. Self-guided tours provided by audio guides allow visitors to experience the museum as their own journey, rather than feeling stuck waiting for a designated tour guide. Although most audio guides follow a linear sequence, visitors who use these guides can nevertheless choose a path that best suits them. This provides visitors with the ability to be in full control of their learning experience (Lee, 2017). Additionally, by utilizing the visitors' smartphone, museums can enhance the ease of use for audio guides, reduce the learning curve associated with handling new equipment, and boost overall accessibility (Gebbensleben et al., 2006). Using visitors' phones also reduces the costs and logistics associated procuring, distributing/collecting, and maintaining audio devices.

Early on in their adoption, museums feared that audio guides impeded conversation and interaction among visitors, reduced engagement with the physical exhibits, and made visitor movement become systemically predictable (Jin, 2015). Although the audio guides do increase dwell times and enhance engagement and learning, Jin (2015) avers that such guides limit interaction with other visitors in the museum, whether the user actually wanted to be left alone.

Despite this decline in social interactions, audio guides and self-guided tours have proven to be great assets to interpretation. One study found that visitors learn as much or more from an audio guide as on a guided tour (Van Winkle, 2012, p. 53). Furthermore, when appealing to members who might want to step away from technology, it was found that booklet self-guided tours were more successful and preferred by visitors than using an application as a guide (Britt, 2017, p. 67). Well-designed self-guided tours and audio guides can mitigate the impact on social interactions.

Some visitors prefer to learn through interpreter-led tours. The experience of the visitor on a tour is shaped by a multitude of factors ranging from what stimulates their senses on the

tour to the reactions with the tour guide and other visitors (Weiler & Black, 2015, p. 366). When thinking about interactions people have on tours, the main personal connection that occurs is between the tourist and the tour guide. Shortt et al. (2018) found that visitors rated their perceptions of the quality of both the content and the interpreter more positively in cases where they experienced a handshake with the interpreter prior to the program, suggesting the importance of interpersonal connections for improving learning outcomes and the visitor experience (pp. 61-62). Many tourists want an enjoyable and memorable experience, but also the ability to co-create experiences that match their personal needs and interests. Ren and Folta (2016) found that although both personal and non-personal interpretation devices allowed audiences to gain short-term memories about the topics being taught, personal interactions were more effective in promoting long-term retention (p. 8). These studies enforce the importance of having effective and engaging interpretive programmatic techniques to increase visitor outcomes. Both ways of interpreting information have positive benefits to learning, but personal approaches tend to have a stronger result.

Habitually, museum tour guides have failed to make a meaningful connection between guides and their audiences (Best, 2012, p. 35). Best (2012) writes that audience members are more than “passive listeners,” but are instead people who engage with the material being presented (p. 45). Best goes on to say that guides should do their best to “optimize” the participation from audience members during tours, so visitors feel that there is opportunity to ask or answer questions as well as engage with guides and the museum (Best, 2012, p. 46). Best emphasizes, “because younger audiences have emerged from an education system which is more interactive and less didactic than the typical guided tour,” more personalized tours would be more effective, especially for younger audiences (Best, 2012, p. 48).

Historical Actors

Another form of in-person interpretation includes historical actors and actresses. These actors enable visitors to immerse themselves in the content of the museum and provide visitors with a way to experience the historical environment and atmosphere (Malcolm-Davies, 2004, p. 286). These actors can bring the historical scene to life, which the exhibit cannot do on its own. By bringing the historical context to life, historical actors provide visitors with the ability to compare their world to one of the past (Handler, 1987, p. 338). Overall, this comparison

enhances visitors' interpretation by inciting them to ask questions and to think about the differences between the historical setting and the present.

Oral Histories

Oral histories are a helpful tool in the retelling of history from a personal perspective. Willa Baum (2007) defines an oral history as "... [the] recording of a knowledgeable person..., about what he/she did or observed of an event or events or way of life of historical interest. ...to preserve that account for users" (p. 15). Baum states that oral histories are personal testimonies that allow an understanding of how social forces can impact people and influence how they respond in their societies (2007, p. 15). Furthermore, Ron Thomson (1999) states that oral histories can provide perspectives from those who are typically underrepresented or overlooked (p. 26). Thomson emphasizes that without oral histories, ordinary people's experiences would go undocumented or ill-recorded (Thomson, 1999, p. 26).

Whether it is reading the description, following a tour, or engaging directly with more interactive components of an exhibit, there are numerous ways a visitor may interact with a museum and other visitors. By expanding and enhancing exhibits with more interpretive devices and techniques, museums can remodel visitor engagement and enhance their experience and interpretation of the exhibits. Text panels, digital interactives, self-paced guides, interpreter-led guides, and oral histories are only a few of the potential interpretive devices a museum can adopt to influence how a visitor interacts with the information presented.

4.2. Active Prolonged Engagement

Increasingly, museums strive to promote active prolonged engagement because it is closely correlated with enhanced learning. Active prolonged engagement, or APE, is described as a deeper form of engagement for visitors and focuses on visitors having meaningful interactions with the exhibits and museum (Humphrey & Gutwill, 2016, p. ii). The APE project that was designed by the Exploratorium serves as an example of how engaging exhibits should be designed to allow visitors to have authority over their own learning (Humphrey & Gutwill, 2016, p. iii). Important design pieces for APE exhibits include creating installations that allow for "open-ended exploration" and "self-driven discovery" using limited amounts of explanatory

text and encouraging greater interactions between the visitors and the exhibit (Humphrey & Gutwill, 2016, p. 3). This advice for creating engaging exhibits has not only been seen in the Exploratorium but also museums such as the Museums of Science Boston and the Science Museum of Minnesota (Humphrey & Gutwill, 2016, p. 3). When working to design engaging exhibits and interpretive devices for museums today the APE model serves as the best example to follow because it encourages movement away from the didactic approach and fosters the use of constructivist methods of interpretation.

Even though APE serves as the best example to follow when working to develop exhibits, it should be noted that the APE model is constantly being revised. In April of 2022, Active Prolonged Engagement eXpanded (APEX) was introduced to build upon APE as a framework for developing and understanding active prolonged engagement with exhibits that did not have the specificity of its predecessor (Long et al., 2022, p. 50:4). APEX works using a coding system that classifies the behavior of participants by four themes: physical, social, intellectual, and emotional (Long et al., 2022, p. 50:11). Within each of the four themes, the behaviors are further categorized using keywords to specify the action being performed (Long et al., 2022, p. 50:12). Whereas the original APE model fell short as something that could be generalized enough to fit other exhibits created outside of the program, the APEX framework can be used in a universal way to learn more about their visitors' engagement.

5. The Walthamstow Pumphouse Museum

Similar to other museums previously discussed, the Walthamstow Pumphouse Museum maintains a collection, conducts research, and constantly strives to create an engaging educational environment for its visitors. The Walthamstow Pumphouse Museum is located in the London borough of Waltham Forest and is centered around a grade II Victorian pumping station, seen in Figure 3. The site was originally home to the Low Hall Farm and manor in 1885. The land was then converted by the Walthamstow Urban District Council and used to create a pumphouse for the purpose of removing and treating sewage (Walthamstow Pumphouse Museum, n.d.). The pumphouse was constructed as a single story with two bays, with the addition of a third bay in 1897 along with two horizontal steam engines. These engines were crucial to the operation due to an incineration plant being installed, as well as the engines being used to directly pump sewage into the main London County Council (LCC) system.

In the 1960s, the steam engines were replaced by an automatically controlled electric pumping station. The boilers and other machinery were removed and sent for scrapping, and the engines would have faced the same fate if not for the intervention of the Depot Manager (Walthamstow Pumphouse Museum | Walthamstow Pumphouse Museum, n.d.). The engines were saved in complete and good condition and have since been restored to working condition. These pumps and engines played a very important role for the Low Hall Works operations with the installation of an incineration plant in 1905, and by 1928 they were being used to directly pump sewage from the main LCC system. Unfortunately for the pumphouse, when steam power became no match for electrical power, it was closed in the 1960's (Walthamstow Pumphouse Museum, n.d.). However, in 1997 the Walthamstow Pumphouse Museum was opened by a group of local enthusiasts housing a full-sized, early-20th-century workshop, including an example of how a machine production line worked using the steam engine (Walthamstow Pumphouse Museum, n.d.). More information regarding the exhibits found in the Walthamstow Pumphouse Museum can be found in Appendix A.



Figure 3: Founding Section of the Walthamstow Pumphouse Museum ("[File:Thae Walthamstow Pumphouse Museum Building.jpg](#)" by [Electrolux2](#) is licensed under [CC BY-SA 3.0](#).)

In its ongoing efforts to improve the visitor experience, the Walthamstow Pumphouse Museum is exploring how to make the interpretation of its collection and exhibits more engaging. The museum would like to replace many of the static text panels with interpretative

approaches that are more appealing, accessible, and informative. These could include digital interfaces, guided and self-guided tours, audio/visuals, and hands-on interactives. These potential changes would support a shift from didactic to constructivist approaches in interpretation. Other museums have performed or reviewed existing visitor studies to make these changes and design new exhibits. This goal falls in line with feedback they have received from visitors since 2020, as seen in Figure 4, who have called for improvements in the museum’s exhibits, interactive experiences, and interpretation.



Figure 4: Visitor Data regarding Areas of Improvement at the Walthamstow Pumphouse Museum

Methods

6. Objectives

The goal of this project was to assist the Walthamstow Pumphouse Museum in developing innovative approaches to interpretations that are more appealing, accessible, informative, and engaging for its target audiences. To achieve the goal of this project, we identified the following four objectives:

- To identify best practices in exhibit interpretation, including the use of digital displays, guided and self-guided tours, audio/visuals, and hands-on interactives.
- To gather and collate archival and other interpretive materials on all aspects of the museum collection.
- To evaluate the demographics, interests, preferences, and behaviors of visitors to the Pumphouse Museum.
- To solicit feedback from Pumphouse staff and volunteers about possible interpretive approaches and materials.

We used a mixed-methods approach, including archival research, observations, interviews, and surveys. Figure 5 shows the major tasks associated with each project objective.

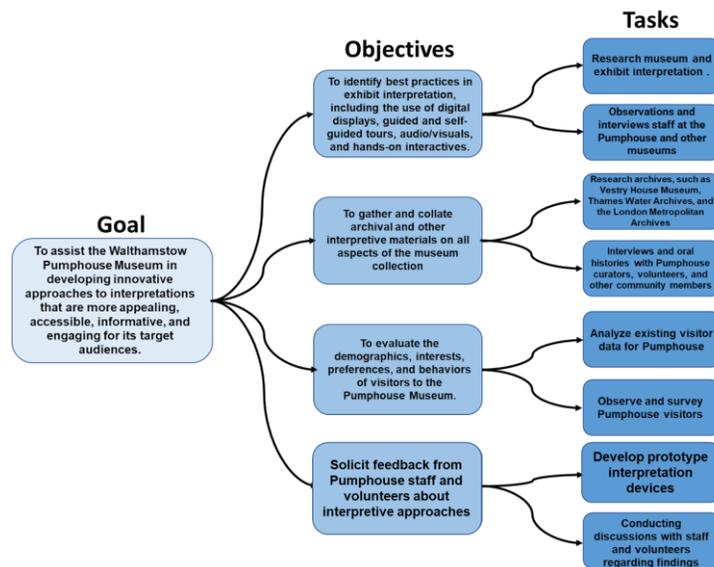


Figure 5: The goals, objectives, and corresponding tasks for the Walthamstow Pumphouse Museum project.

6.1. Objective 1: Identify Best Practices in Exhibit Interpretation

Our first objective was to identify the best practices in exhibit interpretation, including the use of digital displays, self-paced and interpreter-led tours, audio/visuals devices, and hands-on interactives. We supplemented our background research in museum interpretive techniques with interviews of staff at the Pumphouse Museum to identify current approaches to interpretation at the museum and to help us direct our observations at other museums that our project host, Abdullah Seba, recommended.

To begin, we conducted observations at the Walthamstow Pumphouse Museum in the very first days of our project to experience the museum as a visitor would. We toured the museum, observing which different interpretation approaches were used (i.e., amount of text, tone of description, and use of graphics in a specific exhibit). We noted the relative mix of static text panels versus more engaging forms of interpretation, such as graphics or hands-on interactives. We also took notes regarding the effectiveness of the interpretive approaches, their degree of innovation, and the possible ways in which the approaches might be improved. Each team member conducted individual observations and then we compared notes to determine where we agreed or disagreed.

Following our observations at the museum, we then conducted interviews with Walthamstow Pumphouse Museum staff. We conducted three interviews in total with museum staff to learn about their work at the museum, their opinions on the interpretive devices in use, and their thoughts on what should be added to increase visitor interpretation. We began each interview with a preamble (see Appendix B) that explained the rights of the interviewee to skip questions or stop the interview at any time as well as the nature of the interview. If given permission, we recorded the interview and kept written notes for backup. We asked the interviewee for permission to quote them, and we explained that they will have an opportunity to review any materials that we use from the interview prior to publication in the final report. The interview instruments that were used for these interviews can be seen in Appendix C.

In addition to conducting observations and interviews at the Walthamstow Pumphouse Museum, we also conducted observations at other museums recommended by our host, including the London Museum of Water and Steam, the London Science Museum, the Natural History

Museum, the Vestry House Museum, the William Morris Gallery, and the British Museum. We performed a similar observation strategy to what was conducted for the Pumphouse Museum. In these observations, we looked more closely at which different interpretive devices these museums used in comparison to the materials seen at the Pumphouse Museum, and which devices could be integrated into the Pumphouse Museum.

We supplemented our observations with interviews with staff at the British Museum and the Natural History Museum. Similar to our interviews conducted with the staff at the Walthamstow Pumphouse Museum, we were working to understand which interpretive approaches were in use at the museums, how these approaches changed, and how effective these approaches have been in the museums. We followed the same interview process as listed for the Walthamstow Pumphouse Museum staff using the preamble seen in Appendix B and the interview question seen in Appendix D.

6.2. Objective 2: Gather and Collate Archival and Other Interpretive Materials

For our second objective we gathered and organized archival and other interpretive materials to learn more about the history of the Walthamstow Pumphouse Museum and its collection. The collection of materials from the archives provided us with additional information that can be used in the reinterpretation of current and future exhibits. We searched for materials pertaining to the Walthamstow Pumphouse Museum at the Vestry House Museum archives, the National Archives, and the London Metropolitan Archives. We supplemented this archival research through interviews with Walthamstow Pumphouse Museum curators, volunteers, and community members. Some of these interviews were used in developing oral histories about different aspects of the Pumphouse and its collections.

For archival research, our project host indicated that the museum was interested in acquiring copies of documents, maps, floor plans, and photographs that could be used in the reinterpretation efforts and added to the museum's collection. We performed all of the archival research in person at each of the respective locations. As we collected the archival materials, we consulted with the Pumphouse Museum staff to identify which other items or topics might be of interest.

We supplemented our archival research with interviews of Walthamstow Pumphouse Museum volunteers and community members. We used these interviews to learn more about the history of the community, the pumphouse, the museum, and items in the collection. We anticipated that some of the stories may be suitable as oral histories that the museum can use in the reinterpretation efforts. Additionally, these interviews revealed what staff and volunteers believe the visitors would like to learn more about and see in the exhibits. We consulted with the museum director, Abdullah Seba, to identify the staff members and volunteers who were the best to interview on different topics. We also asked our interviewees if they could recommend other people they may know, including members of the local community, who could be interviewed to provide additional information.

We developed a set of preliminary interview questions that were reviewed by our host to ensure that the questions were logical and effective. We tailored our questions to match the interests and expertise of the interviewee. We conducted three interviews with Walthamstow Pumphouse Museum staff and members of the community, and the questions for these interviews can be seen in Appendix E. The questions for volunteers addressed a common set of themes, including work at the museum, history of the museum, and potential improvements for the museum. For both volunteers and members of the community, we developed interview questions related to their connection to specific aspects of the museum and the history of the area. We interviewed Frank Mycock, Melvin Mantell, and Neil Houghton who were knowledgeable about the creation of the Pumphouse Museum. We used a similar interview process as the one described in Section 6.1, and we used the preamble seen in Appendix B in order to explain the nature of the interview and the rights of the interviewee.

6.3. Objective 3: Evaluate the Demographics, Interests, and Behaviors of Visitors

Our third objective was to evaluate demographics, interests, preferences, and behaviors of the Pumphouse Museum visitors through the observation of visitors in the museum and exit surveys. We explain briefly below how we developed the survey instruments, conducted pretesting, and implemented the exit surveys of visitors.

Survey instrument development

The Pumhouse Museum has conducted several previous surveys of visitors. Based on our review of the data and survey questions, we developed a survey instrument (see Appendix F). The survey comprised a mix of open- and closed-response questions with an emphasis on closed responses to enable more efficient data collection and analysis. The survey addressed topics such as where the participants are from, which exhibits they liked, and which kind of interpretive approaches they would like the museum to use. The survey was entirely anonymous. We consulted with Pumhouse Museum staff to refine this instrument and our surveying protocols. We created a preamble or consent script that complied with the GDPR. We consulted our host and determined that Google Forms was the preferred platform since the Pumhouse Museum had used Google Forms to conduct surveys in the past.

Pretest and refine survey instrument

We pretested the survey instrument prior to implementation by putting our survey to use with eleven visitors. We approached adult visitors in the Pumhouse Museum to ask for volunteers to complete the pretesting version of the survey. We explained the purpose of the pretest was to solicit feedback regarding the overall structure, logic, and comprehensibility of the survey instrument. We provided the visitors with a copy of the survey on a tablet, and we asked them to note separately any difficulties they had in understanding the instructions, questions, or response options. After they completed the survey, we debriefed with them to solicit additional feedback. We revised the survey instrument based on the collective feedback received and any additional feedback from our advisors and museum staff.

Sampling and implementation strategies

To conduct the survey, we positioned ourselves in different locations at the museum on Sundays between the hours of 10:30AM and 3:30PM, which is when the museum reported to have the greatest attendance. We attempted to intercept visitors for surveys at appropriate stopping points in the museum, primarily at the exit gates.

To solicit participation, members of the team approached individual visiting adults or one of the adults in a visiting group. We read the preamble at the beginning of the survey (see

Appendix F), explaining the purpose of the survey and that participation is voluntary. We presented people with the option of either having us read the questions for the participants and recording their responses on the tablet *or* providing them with the tablet and allowing them to fill out the survey on their own with us present to answer any questions they may have. The survey took 5 minutes or less to complete. We also clarified that if there were children present at the time of the survey, all questions would be directed to the adult accompanying them for the protection of the minor(s) present.

6.4. Objective 4: Solicit Feedback from Staff and Volunteers

For our fourth objective, we developed prototype interpretive materials for the Pumphouse Museum using the findings from Objectives 1, 2, and 3. We developed prototype text panels that more closely match the standard guidelines used by other museums as well as a prototype activity guide for families.

Following their development, we presented and discussed our prototype materials with staff and volunteers of the museum. We invited staff and volunteers to attend a brief meeting to discuss the interpretive materials that are currently in the museum and our prototype materials. Group discussions were conducted over an hour and thirty-minute period where participants discussed their opinions on the current text panels in the museum and the newly designed text panels followed by discussion on prototype children's activities guides that could be incorporated in the museum. Similarly, to how a focus group works, we tested our recommendations and interpretation methods to gauge their potential efficacy with the staff and volunteers. We created questions to help guide these focus group discussions for the text panels and children's activities guide, seen in Appendix G. In these group discussions, participants were allowed to mark the sample materials and make suggestions based on what could be changed in the materials. These discussions allowed us to further refine our recommendations to better aid the Pumphouse Museum and their mission to enhance visitor interpretations.

6.5. Deliverables

For this project, the final deliverables that were developed include:

- A developed set of findings on best practices in museum interpretation, visitor opinions about the Walthamstow Pumphouse Museum experience, and staff and volunteer suggestions for future interpretive strategies.
- A collection of archival materials that could be used in future reinterpretation efforts.
- Sample text panels and a sample children's activities guide that serve as prototype materials the Pumphouse Museum could develop further for their own use.
- Developed suggestions in the areas of creating a script for the firefighting section of the museum and an audio device to listen to oral histories of local community members.
- A comprehensive report, including recommendations and conclusions, that could be used for future developments at the Walthamstow Pumphouse Museum.

Findings

7. Results and Analysis:

In this section we discuss the findings from our research. First, we discuss our interviews at the British Museum and Natural History Museum, which revealed best practices in exhibit interpretation. Second, we discuss our findings from our archival research and oral histories, which provided supplemental materials for reinterpretation efforts. Third, we discuss our survey findings, which provided insight into visitor demographics and interests at the Walthamstow Pumphouse Museum. Fourth, we discuss our interviews with volunteers and professionals within the Walthamstow community, which allowed us to gain an understanding of their experience related to the museum and the area. We present the findings in the order of our project objectives, followed by our conclusions and recommendations in Section 8.

7.1. Best Practices in Exhibit Interpretation

Based on our literature review, our interviews with staff at the Natural History Museum and British Museum, and our museum observations (i.e., the British Museum, Natural History Museum, Science Museum, London Museum of Water and Steam) we determined that the best practices in exhibit interpretation involve a mixture of self-paced and interpreter-led interactive practices.

Museum Observations

In the British Museum, we found few hands-on interactives because many objects were presented in glass display cases with interpretive text panels. Staff work to make the text panels engaging by highlighting ‘gateway’ objects throughout a collection to draw the attention of the visitors. The exhibits also featured a narrative that helped visitors remain engaged.

The Natural History Museum had a more modern approach to text panels compared to the British Museum. They had a variety of different exhibits that had both text and interactive displays. The display panels were easy to read, not oversaturated with text, and well-lit in darker galleries. This museum also had many larger objects that visitors could look at or touch, such as different rocks or casts of animal bones, allowing visitors to engage more directly with the

artifacts. Where there were smaller objects, the Natural History Museum grouped them and used a numbered key for identification.

Like the Natural History Museum, the Science Museum followed a similar approach to interpretation. The Science Museum used panels with minimal text and numerous images to supplement what was written. The museum also used audio and video devices as alternatives to static text panels. Many of their interactive devices were not only engaging but also highly informative.

The London Museum of Water & Steam had many interactive displays that allowed visitors to touch the machines and experience the sounds and smells of the machinery in a multi-sensory experience. This museum seemed to be designed for younger audiences. For instance, the museum posed multiple quick questions to guide younger visitors to really engage with the exhibit. They also offered activities to make the learning experience more fun and engaging, such as adding hot coals to an engine and inviting visitors to crawl into a tunnel, which simulates being in a sewer.

Curator Interviews

Our interviews with staff at the British Museum and Natural History Museum revealed more about the reasons behind their approaches to exhibit interpretation. Stuart Frost, Head of Interpretation at the British Museum, highlighted how it is the museum's job to "be kind to the visitors" when it comes to showing what the most important objects of an exhibit are. Recently, the museum has used vibrant backgrounds for key objects for easy identification of the important items in the gallery. The museum also uses text panels with bold headlines followed by more detailed text, allowing the visitors to choose whether they would like to learn more or look somewhere else.

The Natural History Museum also tries to grab the visitors' attention but uses a different approach as stated by Lottie Dodwell, the museum's Senior Interpretation Developer. The Natural History Museum has supplemented its text panels with digital interfaces and other simulations. Museum staff try to mold the exhibits and their interpretation to meet the interests and experiences of their visitors. Dodwell highlighted that when the museum is working to create interpretive devices for a new exhibit, staff must consider what the learning hierarchy for the

exhibit will be. When describing the learning hierarchy, Dodwell explained how a person will want to first consider the main message of the exhibit and incorporate more specificity as the museum considers the learning outcomes of the exhibit as a whole.

Dodwell did note that although having an in-person guide is the “gold standard” of interpretation, not all audience members are alike, and a mix of interpretive devices is important for reaching all visitors’ learning styles. Both Frost and Dodwell agreed that there needs to be a balance between more didactic interpretive approaches and interactive digital or hands-on elements. Both also agreed that a compelling narrative is essential for an exhibit, with both museums highlighting how the delivery of an exhibit’s story is the most important method of interpretation. To evaluate the success of this delivery, they work to identify the depth of engagement of a visitor and the holding power of the exhibit and its interpretation as measured by dwell times.

Walthamstow Pumphouse Museum Direction

We learned about the interpretive devices currently in use at the Pumphouse Museum through interviews with the Chief Executive, Abdullah Seba, and volunteers, including museum archivists Lorna Seymour and Paul Beard, as well as our own observations. Overall, volunteers indicated they would like to see more in-depth information about how and why the pumps were used as well as more information on the tube carriages. Seba and Seymour both mentioned how they would like to see general improvements in the way text panels are formatted, which is challenging due to the limited amount of space present for the text panels. Across the interviews, it was noted that visitors’ main takeaway from the museum should include learning more about the history of the area and the different technologies present. Currently, the Walthamstow Pumphouse Museum relies heavily on text panels in the areas of the Pumphouse and the Tube Carriages whereas the Fire Station depends more on guided tours by volunteers.

7.2. Archival Materials and Oral Histories for Reinterpretation

The Pumphouse Museum is keen to expand its collection of maps, drawings, and other archival material to enhance exhibit interpretation. Accordingly, we visited the London Metropolitan Archives, the National Archives, and the Vestry House Museum Archives to identify suitable materials. From the London Metropolitan Archives and the National Archives,

we found several documents that are related to the search terms “Low Hall Farm,” “Low Hall Sewage Works,” “Walthamstow Sewage Works,” “Low Hall Manor,” “Lea Conservatory Board,” “Walthamstow Local Board of Health,” and “John Fieldhouse.” All reference numbers for these documents can be found in Appendix H.

The Vestry House Museum Archive proved to be especially fruitful. We found maps of Waltham Forest prior to 1960, an aerial photograph of the Walthamstow Pumphouse Museum from 1946, and a catalog detailing the history of ownership of Low Hall Farm prior to 1877 when it became the property of the local council. Some of the information from the Vestry House Archives will be useful in amending and supplementing some of the existing text panels.

In addition to collecting archival data, we gathered data from volunteers and community members from the Walthamstow area. One of the volunteers we interviewed was Melvin Mantell. Mantell has been volunteering with the Walthamstow Pumphouse Museum since 1985, after a friend asked him if he was planning on heading down to the area to work on the steam engines. He has lived in Leyton, a neighboring town to Walthamstow, all his life and grew to enjoy volunteering at the Pumphouse museum. He was part of the group of people who chained themselves to the gates when it was rumored that the local council would shut the site down. Since this event, Mantell has been essential in the technical upkeep of the steam engines, and he knows a lot about the history of the building itself. For instance, he was able to tell us how the museum became a listed building because of the steel girders supporting the roof. He described some of the repairs and the troubles entailed by the local council in making them. Mantell also told us about the history of land that the museum sits on, and how the council has reappropriated some of the surrounding land and buildings for other purposes in a quid pro quo that allows the museum to remain.

We also spoke to another volunteer, Frank Mycock. He has been with the Walthamstow Pumphouse Museum for nearly twenty years, but he was originally a firefighter from Manchester. He worked with the Manchester firefighting division for nearly twenty-one and a half years, and he also worked with the Royal Air Force for several years. Mycock owns many of the items and materials that are in the Fire Station portion of the museum. Most of the information he provided was about the history of firefighting in England from all the way back to the 1800s.

The final interview we performed was with Neil Houghton. Houghton has volunteered with the Walthamstow Pumphouse Museum since it first opened and has lived in Walthamstow all his life. His family has been there since 1842. Not only does he have an extensive family history in the community, but he is also an archeologist and a heritage professional with a Master of Arts in heritage studies. He told us how the Pumphouse Museum acquired many of its exhibits. According to Houghton, locals would drop off old machinery and other items related to the industrial heritage of the area, and the head engineer at the time decided to keep and fix them. In this way, he said the Walthamstow Pumphouse Museum was less of a museum but more of a heritage center.

Through our archival research and interviews we gained a deeper understanding of the relationship that the museum has to the local council and community. Volunteers have put considerable time, care, and effort into the development and upkeep of the museum, which is considered a local treasure.

7.3. The Demographics, Interests, and Behaviors of Visitors

To learn more about the interests of visitors at the museum, we conducted exit surveys over the course of three consecutive Sundays when the museum was open. We collected 56 surveys in total as visitors were exiting the museum. The survey contained five different sections that focus on visitor demographics, experience at the museum, personal interest in the museum, personal understanding of the exhibits, and new ways of learning at the museum.

Regarding visitor demographics, we found that 59.3% of the visitors were from Walthamstow (Figure 6) and the majority of visitors attended in groups of 2 to 4 people (Figure 7).

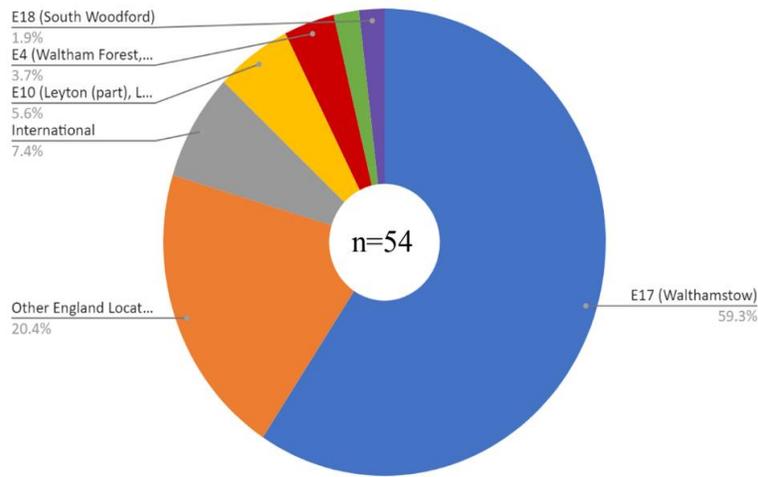


Figure 6: The origins of visitors to the Walthamstow Pumphouse Museum (n = 54)

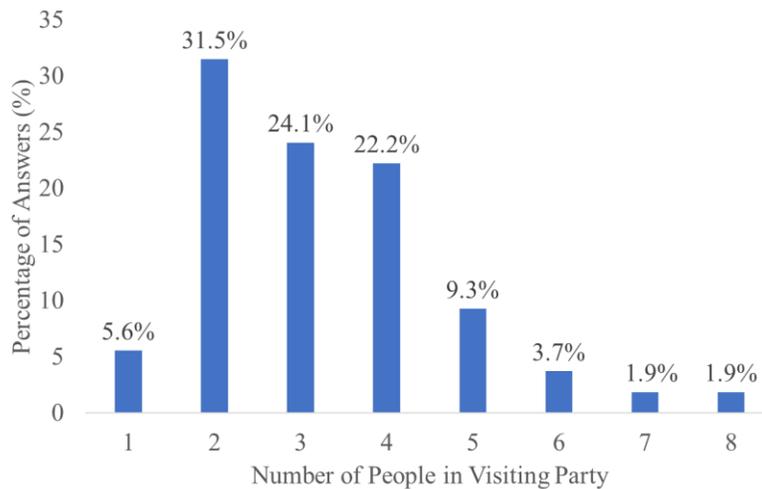


Figure 7: Number of people in visiting parties (n = 54)

Most (81.8%) respondents attended the museum with their family (Figure 8), and 45.1% indicated their primary reason for visiting was for a family day out (Figure 9). Among the reasons respondents gave for enjoying exhibits at the museum, many (34.4%) said their ‘kids love it’ and 28.1% said they were especially interested in the history of the area. (Figure 10).

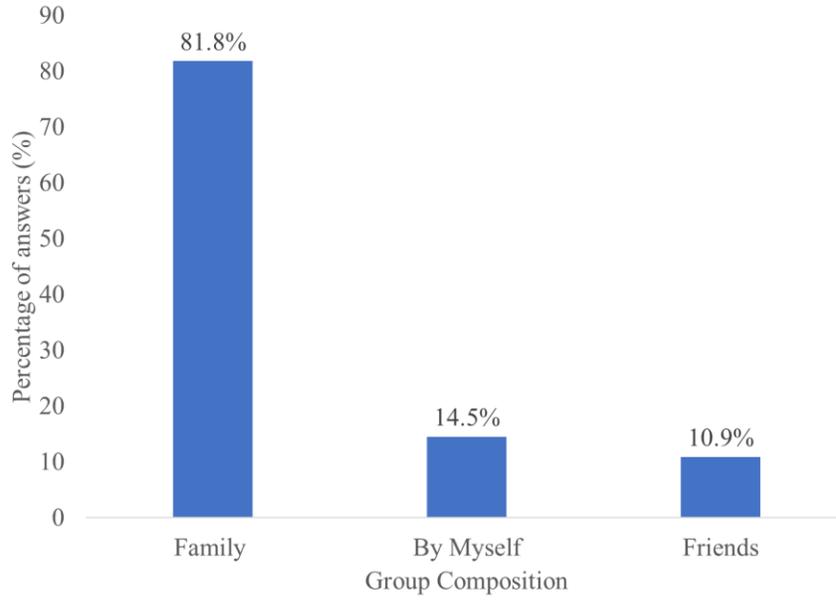


Figure 8: Group composition of respondents (n = 55)

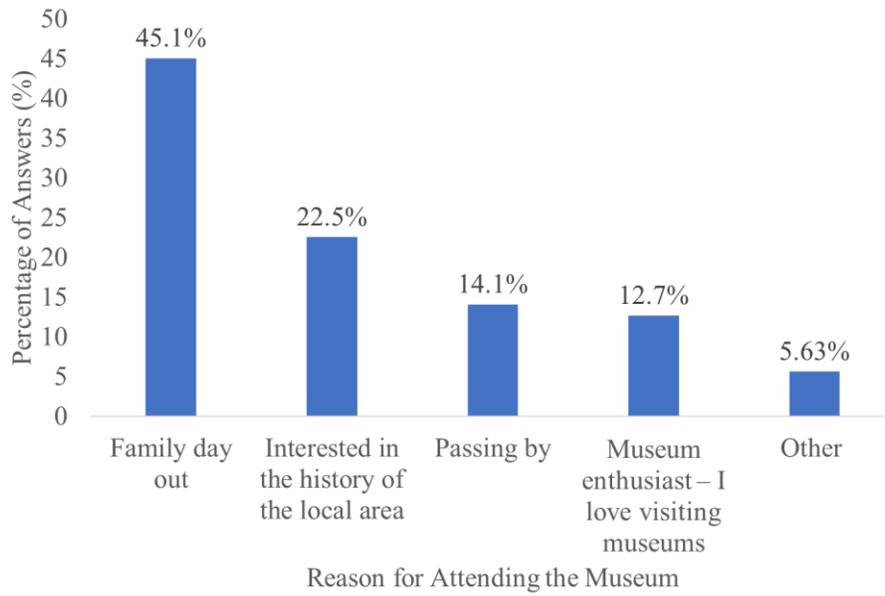


Figure 9: Reasons respondents attend the museum (n=55)

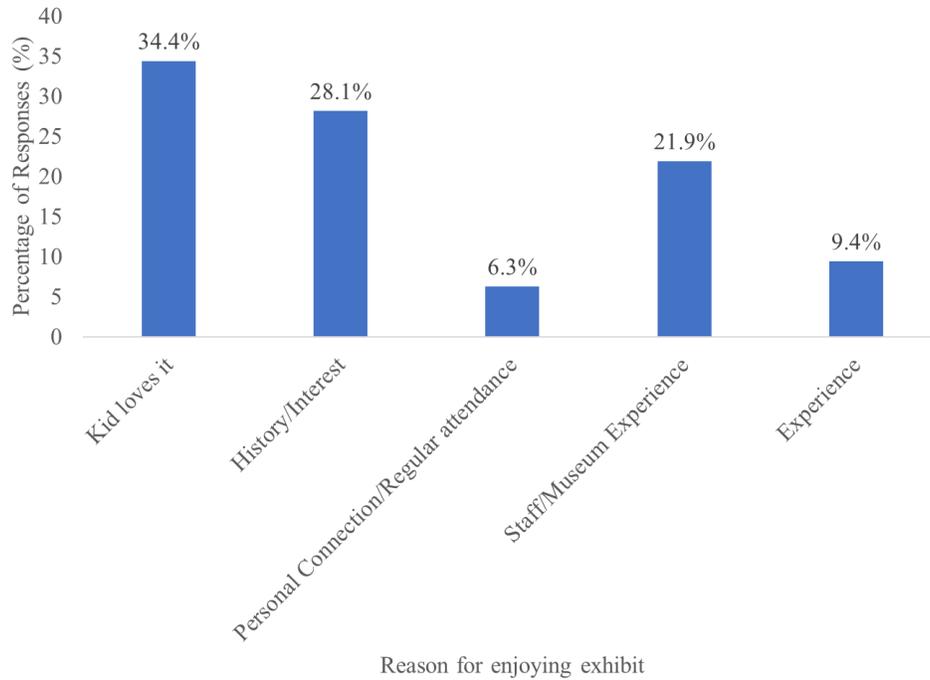


Figure 10: Respondents reason for interest for museum exhibits (n=55)

Along the same lines, 36.7% of respondents said they would like to see “historical timelines showing progression of the technologies featured at museum,” 32.9 % of respondents said they would like to see “more images/photographs,” and 24.1% said they would like to see “information on how the museum obtained their collections” (Figure 11).

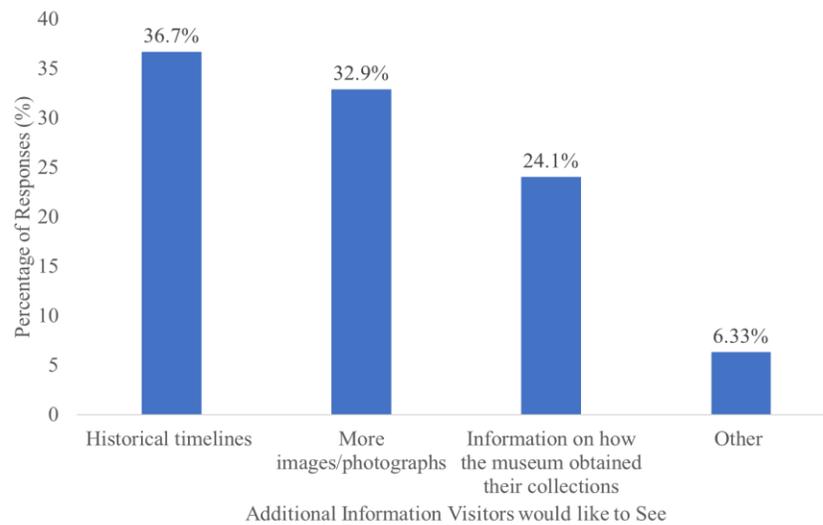


Figure 11: Additional information visitors would like to see (n=51)

The survey responses show that when visiting other museums visitors tend to prefer to learn using hands-on interactives (52.8%), text panels (49.1%), and staff-led guided tours (39.6%) as the three main forms of interpretive devices (Figure 12). When asked specifically about the text panels seen at the Walthamstow Pumphouse Museum, 44% of visitors stated that they only read some of the text panels (Figure 13). Our conversations with visitors indicated that many of them did not have the chance to read as many text panels as they would have liked because they had to watch their children. Figure 14 shows that a large proportion of people think there is little need for additional explanatory information, although a substantial number of survey participants thought that each area would benefit from additional information¹.

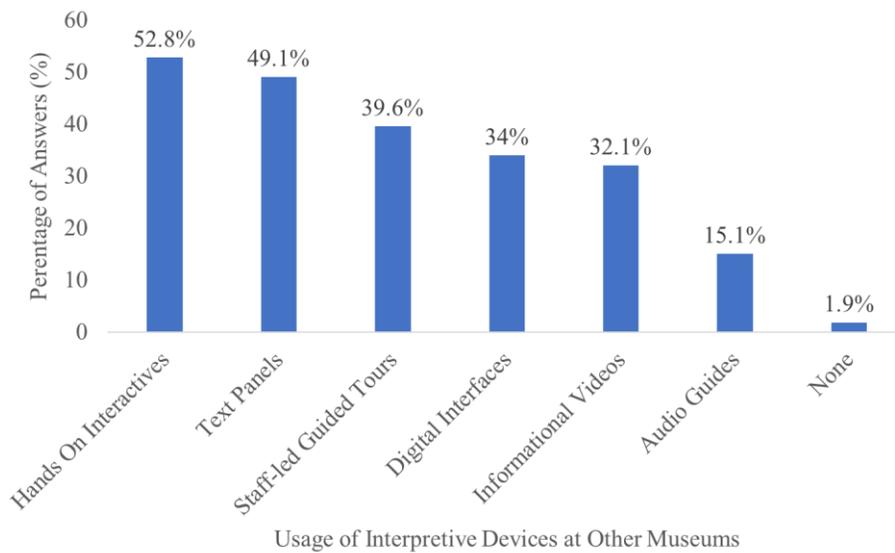


Figure 12: Visitor usage of interpretive devices at other museums (n=55)

¹ Note that the relatively large number of N/As regarding the Model Railway (Figure 14) may reflect the fact that this area was closed at the time we conducted the survey.

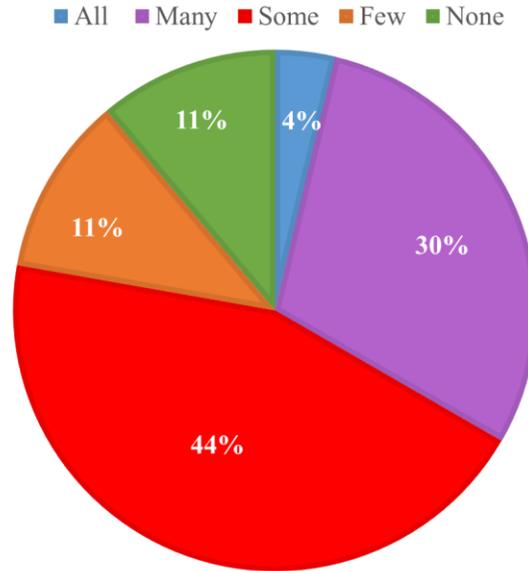


Figure 13: Proportion of text panels visitors read (n = 54)

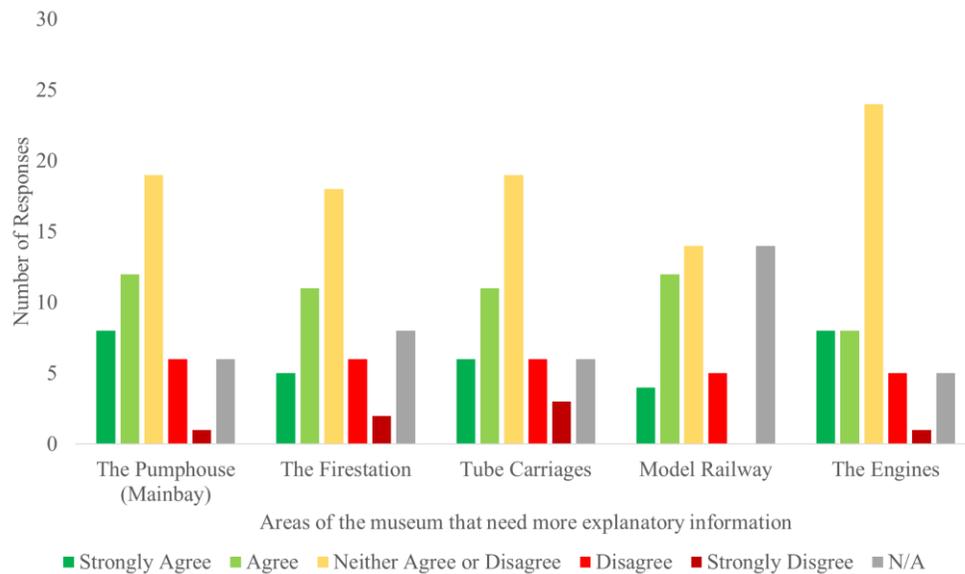


Figure 14: Visitor responses regarding which areas of the museum need more explanatory information (n=52)

Most respondents agreed that the text was easy to read, informative, and in an accessible location, but a majority of visitors disagreed or disagreed strongly that the text panels were fun (Figure 15). When asked which feedback they would give to improve the text panels, the top three improvements that visitors requested were more visual accompaniment, better placement,

and larger font size (Figure 16). However, visitors overall enjoyed the text panels and said they were interesting (Figure 17).

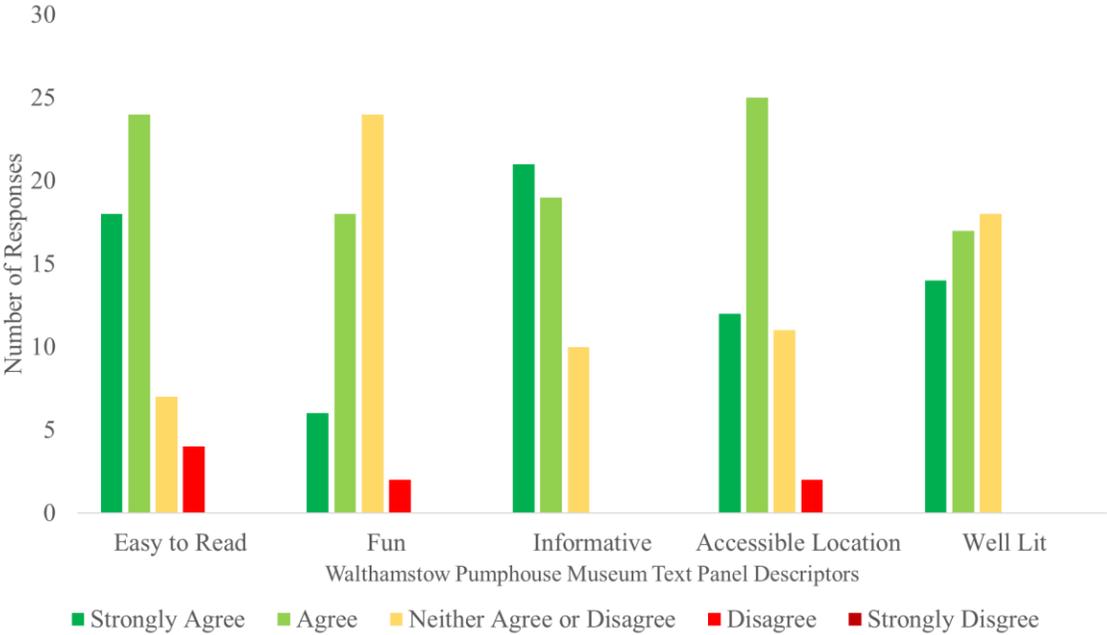


Figure 15: Visitor responses regarding the text panels at the Walthamstow Pumphouse Museum (n=53)

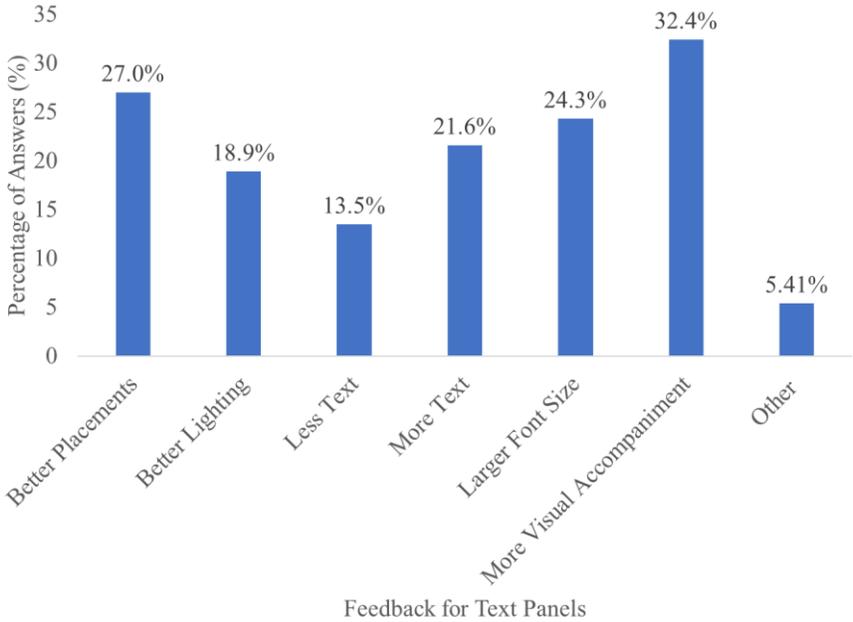


Figure 16: Visitor Feedback on Text Panels at the Pumphouse (n=37)

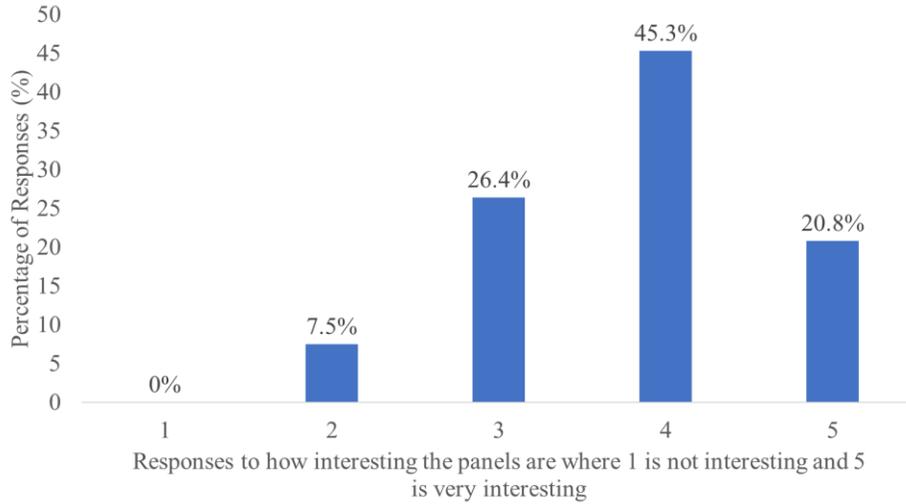


Figure 17: Visitor responses to how interesting the texts panels were (n=53)

Overall, visitors had great experiences at the museum, with a vast majority of respondents saying that they would be likely or very likely to return to the museum based on their experience (Figure 18). Nevertheless, many respondents indicated that they would like to see more interactives and more seating for the cafe (Figure 19). Figure 20 shows that respondents would like to see more staff-led tours, children’s activities guides, and digital interfaces, but were less keen on audio guides or interpretive actors.

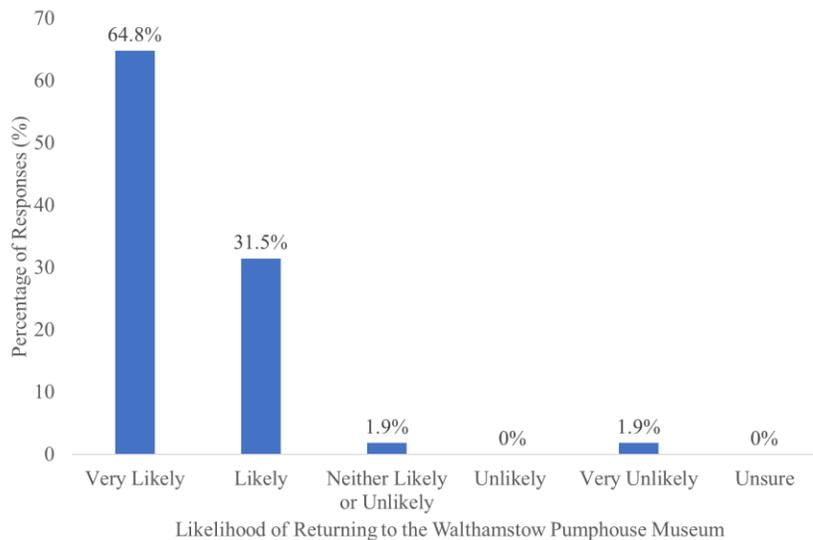


Figure 18: Visitor responses for how likely they would be to return to the Pumphouse (n=54)

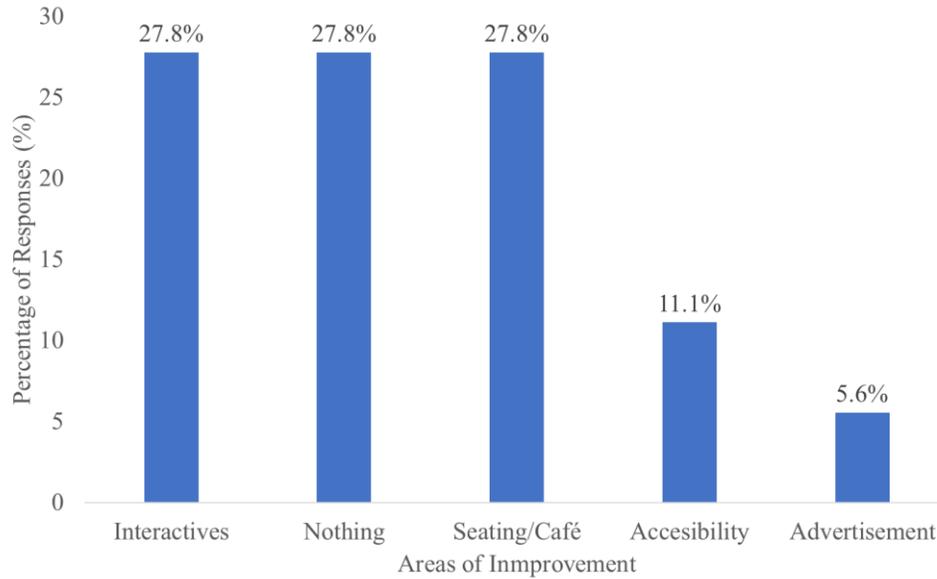


Figure 19: Areas of Improvement Visitors would like to see at the Pumphouse (n=18)

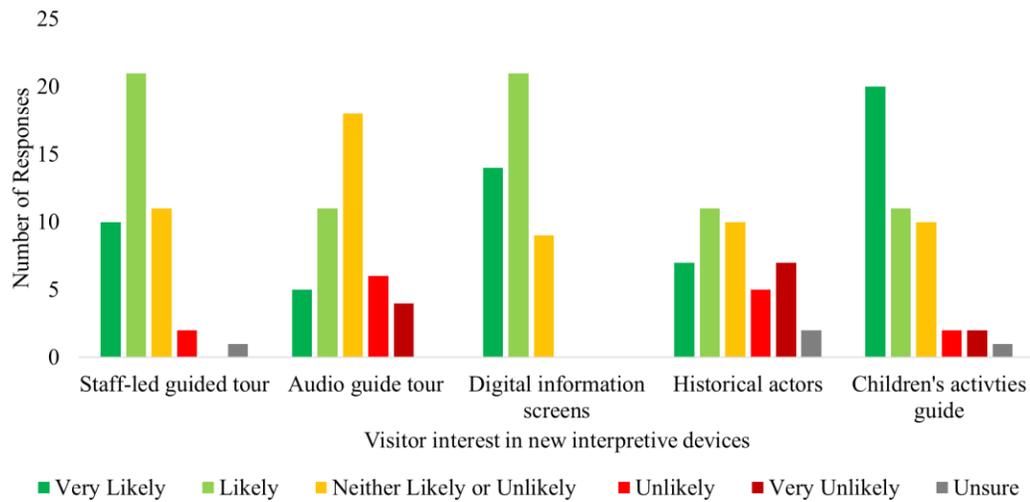


Figure 20: Visitor interest in interpretive devices that could be added to the museum (n = 46)

7.4. Feedback from Staff and Volunteers on Prototypes

Utilizing some of our earlier findings, we developed two prototype interpretive devices. These prototypes included redesigned text panels (Appendix K) and a children’s activity guide (Appendix L) that could serve as starting points for future interpretive device development. We

convened a focus group with volunteers at the Pumphouse Museum to solicit feedback about these prototype designs and concepts.

A dominant theme in the focus group was a general agreement that the current text panels should be updated. Participants noted that the current panels lacked uniformity and were “unprofessional”. Additionally, participants pointed out that the graphics associated with some text panels were unrelated to the display or section of the museum. Evidently, the group expressed a clear desire for improvements with the text panels.

Regarding our prototype text panel design, participants were concerned that the panels were too simple to appeal to adults and that some of the information was lost in the simplification. Most of the feedback focused more on the content and wording rather than the design and layout. Participants zeroed in on inaccuracies in the prototype, although we believe the prototype accurately reflects the content of the original panels. We suspect that there may be inaccuracies in the original text, but volunteers may not have reviewed those panels closely in several years. Despite having a solid turnout for the focus group, only a small percentage of participants marked up the copies of our prototype text panels with specific comments or editorial suggestions.

We were inspired to develop the prototype children’s activity guide for several reasons. First, our visits to other museums suggested the value of this guide. During our observations at the William Morris Gallery, we noticed an activities guide that was used to direct children and families throughout the museum. Second, during the early testing for our survey, we noticed that many of Pumphouse Museum’s visitor groups are families. Third, the results of our survey indicated that a children’s activities guide might be very popular among visitors to the Pumphouse Museum.

Accordingly, we developed two different prototypes of a children’s guide for discussion in the focus group. During the discussion, we learned that the Pumphouse Museum has wanted to create a children’s guide for a while. The consensus was that the volunteers loved the idea and concept because it would boost engagement and interpretation for children, and it would give families and children better experiences at the museum. We received a variety of feedback from participants ranging from content to design choices. Participants, however, noted that the guides

needed more personality and spirit, that the text was too simple, and that it would likely only be effective for very young children. We also received feedback about the map we designed for the guide. Participants suggested that we should create new labels on key displays and increase the prominence of specific displays. Some participants were concerned that by drawing inspiration from the William Morris Gallery, we might focus too much on art and thus lose the emphasis on the engineering roots of the museum. As with the text panels, only a small number of participants marked up copies of the prototype guide.

8. Conclusions and Recommendations:

The goal of this project was to assist the Walthamstow Pumphouse Museum in developing innovative approaches to interpretations that are more appealing, accessible, informative, and engaging for its target audiences. Based on the survey responses, interviews, focus groups, and observations, we learned about the community that makes up the museum and the improvements the volunteers and visitors would like to see. Furthermore, we learned about modern museums' current best practices in interpretation and how the Walthamstow Pumphouse Museum could incorporate those methods.

The Walthamstow Pumphouse Museum is a museum founded for and loved by the local community of Walthamstow. Our survey responses and interviews suggest that although members of the community want to see improvements in the museum, they also want the museum to maintain its unique personality. Neil Houghton explained that unlike other, bigger museums, the Pumphouse Museum has not become distant or removed from the community; instead, the community is intimately connected with the museum. The focus group participants noted that the museum serves a role in uniting the community and fosters community spirit among the visitors. One visitor described the museum endearingly as "ramshackle," and visitors and volunteers emphasized that this is part of the museum's charm.

Although we will make several recommendations below for how the museum can improve the visitor experience, it is crucial to ensure that the museum maintains its charm that appeals to locals and encourages repeat visitation. We suggest that the museum work with volunteers and community members throughout the updating process. Our recommendations incorporate working to improve visitor interpretation while maintaining the community spirit that visitors love. *Our recommendations are: (1) Develop a master plan and learning hierarchy, (2) Incorporate archival materials in reinterpretation efforts, and (3) Modify and add various interpretation devices.*

Develop a master plan and learning hierarchy

From our interviews with the Natural History Museum and the British Museum, it became clear that many museums develop master plans to guide all their developments. *We recommend that the Walthamstow Pumphouse Museum develop a master plan and learning*

hierarchy to guide the future design and installation of exhibits and interpretive devices. The master plan should identify the hierarchy of learning outcomes for the different galleries and exhibits with input from volunteers and members of the community.

While developing a master plan is common practice in museums, *we recommend that the Walthamstow Pumphouse Museum takes a different approach than what is often followed by larger-scale museums.* As noted by one participant in the focus group, each section of the museum has very different interpretive devices from the others; if the museum applied one uniform learning outcome for the whole museum, then the unique nature of the individual sections would be lost. *We recommend that the museum develops learning outcomes that are specific for each of the separate sections of the museum.*

More importantly, the community should be involved in the development of a master plan for the Pumphouse Museum. Our interview with Lottie Dodwell highlighted the importance of the creation of a master plan showcasing how the master plan is created by staff, and products from the plan are developed through consultations with community members. Including the local community in the Pumphouse Museum's planning is essential to retaining the museum's charm for visitors, and the museum should incorporate visitor feedback and ideas into any developments made. *For these reasons, we recommend that the community is involved in the development of the master plan for the museum and its future goals.* To help guide the Pumphouse Museum in this process, we have developed a sample learning hierarchy model worksheet that can be found in Appendix I.

Incorporate archival materials in reinterpretation efforts

In addition to developing a master plan and learning hierarchy, the Pumphouse Museum should look for additional materials that could be used in reinterpretation efforts. Visitors indicated that a historical timeline and narrative would aid their comprehension of the exhibits. Volunteers suggested that the interpretive materials use more graphic elements that are clearly related to the exhibits and are developed following uniform design guidelines. While performing archival research at the London Metropolitan Archives, National Archives, and Vestry House Museum Archives, we identified materials that could be used by the museum. The Vestry House Museum Archives has multiple photographs, maps, and articles that showcase the history of Low Hall Farm to the development of the museum. These items could be used to develop a historical

timeline of the land as well as serve as supplemental graphic materials. The London Metropolitan Archives has an online database in which researchers can access a variety of photographs and videos, all of which the museum could use as graphic accompaniment to its text panels. *We recommend that volunteers and/or staff visit the London Metropolitan Archives, National Archives, and Vestry House Museum Archives, with a primary focus on the Vestry House Museum Archives because this archive had the greatest amount of pertinent information.*

Modify and add various interpretation devices

Our following suggestions relate to interpretive devices that can be updated or added to the Walthamstow Pumphouse Museum to enhance the visitor experience and understanding. These suggestions are guided by visitor survey responses, interviews with museum staff, and focus group understandings. The interpretive devices we recommend be incorporated or updated include text panels, a children's activities guide, staff-led tours, an oral history device, and interactive devices.

Text Panels

Interviews and focus groups with staff and volunteers highlighted a general desire for the text panels in use at the Walthamstow Pumphouse Museum to be updated. We worked to remodel the text panels by following the advice of the British Museum and the Natural History Museum. As discovered in the interviews with these museums, text panels should include a narrative that connects to the audience while also highlighting the important information so readers can decide if they want to keep reading.

We recommend that the text panels at the Walthamstow Pumphouse Museum be updated in the areas of content, presentation, and accessibility. We developed layouts for two text panel boards in the museum: the introductory text panel board and the movement of sewage board (Appendix J). For the introductory board, this new layout reflects a chronological line of events that moves from left to right across the board, with text panels that showcase the narrative of the land on which the Pumphouse is built. The movement of sewage layout highlights how diagrams can be used as effective methods to present information relating to scientific/engineering processes as well as how a numbering system for text panels can be developed. Following the guidance of Stuart Frost and the British Museum, we also designed examples of text panels and guidelines that follow an information hierarchy, in which the text becomes more specific as a

reader continues to read. We also incorporated feedback from the focus group participants so that these panels reflect the desired specificity recommended by the volunteers without becoming too technical. These prototypes (Appendix K) serve as examples that could be incorporated in future developments at the museum.

For accessibility, *we recommend: (1) adding QR codes to text panels, so visitors could access audio recordings of the material through their mobile devices, (2) placing the text panels in well-lit areas and without obstruction, and (3) printing the panels in a matte lamination rather than glossy so that the panels are easier to read without light reflection.*

Children’s Activity Guide

From our surveys and observations, we learned that a majority of visitors come to the Pumphouse Museum with their families, especially families with younger children. We developed the idea of a children’s activities guide that volunteers and visitors both expressed great interest in. This guide serves as an interpretive device that will allow younger visitors to connect more deeply with the material being presented. Based on the feedback we received from volunteers and our host, we developed two prototype guides, one geared more towards younger children and the other towards adults and their families. These can be found in Appendix L. *We recommend that the museum incorporate the use of children’s activities guides for their visitors, using these prototypes as starting points for development.*

Further additions to the activities guide would include a connection between the guide itself and items to look for throughout the museum. One idea would include incorporating a character or symbol that would grab people’s attention and get them to take a closer look at some exhibit details. This character should be incorporated with the text paneling and the activities guide to allow for a greater connection with the subject areas at the museum.

Staff-Led Tours

The importance of having a variety of interpretive devices from staff-led interpretation to self-paced interpretive devices was made clear in our interviews with Stuart Frost and Lottie Dodwell. Presenting information in a variety of ways improves accessibility for visitors of different learning types, with tours being highlighted as a “gold standard” for interpretation. One item that was highlighted in conversations with volunteers is the fact that there are audio

recordings and transcripts for a guided tour of the Fire Station area of the museum, which is the only area that has a tour that is currently only conducted by one volunteer at the museum. *We recommend that the museum should develop a formal script for the Fire Station area, using its existing audio recordings for a guided tour of the entire museum.*

Oral Histories

From our interviews with volunteers, we learned the museum previously used an old telephone as an interactive device; visitors could pick up the telephone and hear a recording of an engineer that worked in the Pumphouse. Many of the volunteers said they enjoyed this device as it formed a more tangible connection to the history for visitors as well as a greater connection to the community. *We recommend bringing back a device to allow visitors to hear oral histories, and we recommend expanding upon the material that was available with the addition of new interviews including oral histories from Melvin Mantell, Frank Mycock, and Neil Houghton.*

Interactives

During the surveys, many visitors expressed interest in the addition of interactive devices throughout the museum, with a primary focus for an addition of devices in the Fire Station. Interactive devices allow for a more hands-on learning experience, which can be great for children and families alike. Based on our observations, the interactive materials could include simple ideas like a dress-up station or interactive panels like those seen at the London Museum of Water and Steam. *We recommend that the Walthamstow Pumphouse Museum incorporate more interactive devices, starting with the addition of materials in the Fire Station.*

For example, the museum could offer a space in the Fire Station where children could dress up as firefighters. The costumes could replicate historical firefighting uniforms from the area to form a connection with the history. Families could also take photographs of themselves and their children dressed-up and could be encouraged to post them on social media, which would then allow the Pumphouse Museum to have a greater social media presence and promote greater outreach, which was recommended by visitors.

Limitations and Future Directions

From our findings, we determined the best practices that the museum can use to increase

visitor interpretation, but there are limitations. For example, we were only able to interview two outside museums, the British Museum and the Natural History Museum. There is a limitation insofar as some of the recommendations from these museums are larger in scale than what the Walthamstow Pumphouse Museum would want. Additionally, for our survey responses, while we had a large sample size, some visitors were rushed to answer questions. Future studies could attempt to sample a greater number of visitors or adjust the survey to increase visitor response rates. Additionally, future research could attempt to interview curators at more locally based museums including the Vestry House Museum and the William Morris Gallery to gain more insight into their interpretive practices.

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Appendix:

Appendix A: Walthamstow Pumphouse Museum Background

Collection and Exhibits

In regard to their collection, the museum houses a full-sized early 20th century workshop, showcasing how a machine production line worked using the steam engine and pumps, as seen in Figure A.1 (*Walthamstow Pumphouse Museum*, n.d.). The Pumphouse also houses a model railway where the boiler room used to be. The model railway, as seen in Figure A.2, portrays the Chingford to Liverpool Street line during various parts of the steam era and offers an interactive way for visitors to learn how railways functioned in the past. The model is currently operational and very popular among younger visitors and adults and is being developed further by a team of staff and volunteers (*Walthamstow Pumphouse Museum*, n.d.). Outside the pumphouse, the museum showcases two 1967 tube stock Victoria Line carriages shown in Figure A.3. The carriages demonstrate the innovations in train technology of the time as the Victoria Line was the first fully underground railway in the world (*Walthamstow Pumphouse Museum*, n.d.). The carriages also serve as an additional revenue stream for the museum since they can be rented as a dinner venue and have been used in several films and TV programs (*Walthamstow Pumphouse Museum*, n.d.). Finally, the museum has an extensive collection of firefighting equipment and associated artifacts, including objects from the 1800's to the modern day (*Walthamstow Pumphouse Museum*, n.d.). One of the fire trucks in possession by the Walthamstow Pumphouse Museum can be seen in Figure A.4. Some of the artifacts featured in this collection include a Victorian horse drawn Leyton engine and a famous Dennis fire engine, which has been featured in films and TV programs (*Walthamstow Pumphouse Museum*, n.d.).



Figure A.1: Production Line Exhibit at the Walthamstow Pumhouse Museum ("[Walthamstow Pumhouse Museum](#)" by [diamond geezer](#) is licensed under [CC BY-NC-ND 2.0](#)).



Figure A.2: Model Railway Exhibit at the Walthamstow Pumhouse Museum ("[Walthamstow in 00](#)" by [failing_angel](#) is licensed under [CC BY-NC-SA 2.0](#)).



Figure A.3: The inside of one of the 1967 Tube Stock Carriages at the Walthamstow Pumphouse Museum ("[1967 stock](#)" by [diamond geezer](#) is licensed under [CC BY-NC-ND 2.0](#)).



Figure A.4: The Dennis fire engine at the Walthamstow Pumphouse Museum ([“Dennis Fire Engine as Used in Several Series of ITV’s London’s Burning - Picture of Walthamstow Pumphouse Museum - Tripadvisor,” 2022]).

Membership

Walthamstow Pumphouse Museum’s main mission is to engage with the community. In addition to housing various pieces of machinery, the volunteers who run the museum aim to educate the Waltham Forest community on its rich history of manufacturing and transportation

and the long-gone technologies that allowed their borough to become successful and affluent (*Walthamstow Pumphouse Museum Governing Document, 2022*). The museum also offers memberships to the most dedicated museum enthusiasts and those who wish to support the museum. Some of these perks to the membership include a quarterly newsletter, a discount at the gift shop and on private events, as well as access to membership-only events. The higher end membership offers exclusive events like getting to see the engines and pumps operating (*Walthamstow Pumphouse Museum, n.d.*). There are also activities hosted by the museum where patrons can book a dinner or an event in the museum's tube carriages or even rent them for film or photography projects as shown in Figure A.5 (*Walthamstow Pumphouse Museum, n.d.*).



Figure A.5: Dinner in the tube carriages ([Underground Dining in the Walthamstow Pumphouse Museum], 2023).

Appendix B: Preamble Script for Museum Staff:

Hello! We are a group of students from Worcester Polytechnic Institute (WPI), and we are conducting a research project in collaboration with the Walthamstow Pumphouse Museum in order to develop new approaches to interpretation for visitors of the museum.

Would you be willing to take thirty minutes in order to answer some questions regarding your work at _____ museum and the interpretative approaches you have set in place at _____ museum? This survey should take about 30 to 45 minutes and is completely anonymous. You can request to stop the interview at any time, and may choose to not answer any of the questions. We would like to audio record and take notes of the interview with your consent. The interview recording and notes and any personal data you choose to share with us will be stored securely and disposed of by 29 June 2023 in line with the UK General Data Protection Regulation 2018. WPI and the Walthamstow Pumphouse Museum will produce research reports and other outputs using the data we collect from the survey. We would like to attribute quotes to you and would ask for your approval of quotes we use prior to publication. However, we can report your feedback anonymously if you prefer. We are also happy to provide you with a copy of our full report upon completion if you would like a copy. Thank you so much for your support in this research.

Do you have any questions before we begin? If you have any concerns or questions after the interview, you can contact us at gr-lon_d23_pumphouse@wpi.edu or our WPI project advisors, Laureen Elgert (lclgert@wpi.edu), Dominic Golding (golding@wpi.edu), and Sarah Riddick (sriddick@wpi.edu).

Interview Preamble was developed using material from (Hosea et. al., 2017)

Appendix C: Questions for Walthamstow Pumphouse Museum Staff on Interpretation Devices

See Appendix B for Preamble Script

Interview with Abdullah Seba

Category 1: Work at the Museum

1. How long have you been volunteering/working at the Walthamstow Pumphouse Museum?
2. How often do you volunteer/work at the Walthamstow Pumphouse Museum?
3. What made you start volunteering/working at the Walthamstow Pumphouse Museum?
4. What is your job at the Walthamstow Pumphouse Museums?

Category 2: History of the Museum

1. What information do you know regarding the history of the museum?
2. What pieces of history would you like to know more about in regard to the museum?
3. What do you like regarding how the history and exhibits of the museum are presented?

Category 3: Improvements in the Museum

1. What would you like to see improved or updated in the museum?
2. What would you like visitors to take away from the museum?

3. If any, what interpretive devices would you like to see added to enhance visitor experience?
4. If you could change anything about the way information is presented in the museum, what would you change?

Category 4: Text Panels as Interpretive Devices

1. How do you decide how many text panels to use?
2. How much text do you believe should be on each panel?
3. How do you work to ensure text panels are accessible to various reading levels?
4. How do you ensure that text panels are accessible to all people?
5. How do you make the text compelling for different audiences?

Category 5: Assessing Interpretive Devices

1. How do you evaluate the success of a particular interpretive device?
2. What have visitors' overall responses been to the interpretive devices at the Walthamstow Pumphouse Museum?
3. How do you decide how many interpretive devices are necessary prior to it becoming too overwhelming for visitors?
4. What would you define a successful interpretative device to be generally? Do you believe that there are successful interpretive devices being utilized in your museum?

Interview with Archivist

Category 1: Work at the Museum

1. How long have you been volunteering/working at the Walthamstow Pumphouse Museum?
2. How often do you volunteer/work at the Walthamstow Pumphouse Museum?
3. What made you start volunteering/working at the Walthamstow Pumphouse Museum?
4. What is your job at the Walthamstow Pumphouse Museums?

Category 2: History of the Museum

1. What information do you know regarding the history of the museum?
2. What pieces of history would you like to know more about in regard to the museum?
3. What do you like regarding how the history and exhibits of the museum are presented?
4. What do you think should be changed regarding how the history and exhibits of the museum should be presented?

Category 3: Improvements in the Museum

1. What would you like to see improved or updated in the museum?
2. What would you like visitors to take away from the museum?
3. What do you like regarding how the exhibits of the museum are presented?
4. If any, what interpretive devices would you like to see added to enhance visitor experience?

5. If you could change anything about the way information is presented in the museum, what would you change?

Category 4: Text Panels as Interpretive Devices

1. How do you decide how many text panels to use?
2. How much text do you believe should be on each panel?
3. How do you work to ensure text panels are accessible to various reading levels?
4. How do you ensure that text panels are accessible to all people?
5. How do you make the text compelling for different audiences?

Category 5: Assessing Interpretive Devices

1. How do you evaluate the success of a particular interpretive device?
2. What have visitors' overall responses been to the interpretive devices at the Walthamstow Pumphouse Museum?
3. How do you decide how many interpretive devices are necessary prior to it becoming too overwhelming for visitors?
4. What would you define a successful interpretative device to be generally? Do you believe that there are successful interpretive devices being utilized in your museum?

Appendix D: Interview Questions for Outside Museum Staff on Museum Interpretation

See Appendix B for Preamble Script

Category 1: Forms of Interpretation/Interpretive Devices in the Museum

1. What techniques of interpretation have they found to be most effective?
2. Are you taking any new directions? If so, what are these new directions?
3. What differences are there between new and old exhibits/interpretations?
4. What elements of the old interpretations limit their effectiveness?
5. What elements enhance the interpretation?
6. Are there particular interpretive devices that you find work better than others?

Category 2: Text Panels as Interpretive Devices

1. How do you decide how many text panels to use?
2. How much text do you believe should be on each panel?
3. How do you work to ensure text panels are accessible to various reading levels?
4. How do you ensure that text panels are accessible to all people?
5. How do you decide what fonts, colors, text sizes, etc. to use for text panels?
6. What forms of graphics do you normally place alongside these text panels?
7. How do you make the text compelling for different audiences?

8. What supplier did you go to in order to create the text panels that you have in the museum?

Category 3: Interactive/Modern Interpretive Devices

1. What modern interactive devices has your museum incorporated/thought about incorporating?
2. What modern technologies have been incorporated into your museum to be used for better interpretation?
3. What have you found to be some of the advantages and disadvantages of using digital kiosks for interpretation?
4. How do you determine a balance between modern interpretive devices and more static interpretive devices?

Category 4: Personal/Non-personal Interpretive Methods

1. Are there any personal methods of interpretation that your museum uses (i.e. historical actors, guided tours, etc.)?
2. Are the personal methods of interpretation successful?
3. Do visitors of your museum tend to prefer personal methods, non-personal methods, or a mix of both styles while going through the museum?
4. What is the best way to maintain a balance between personal interpretive methods and non-personal interpretive devices?
5. If your museum has guided tours, how did you work to develop the scripts for your tours?

Category 5: Assessing Interpretive Devices

1. How do you evaluate the success of a particular interpretive device?
2. What have visitors' overall responses been to the interpretive devices that are found in your museum?
3. How do you decide how many interpretive devices are necessary prior to it becoming too overwhelming for visitors?
4. What would you define a successful interpretative device to be generally? Do you believe that there are successful interpretive devices being utilized in your museum?

Category 6: Recommendations

1. Are there any sources you would recommend for us to look at for more information?
2. Are there other people that you would recommend for us to talk to for more information?

Appendix E: Questions for Walthamstow Pumphouse Museum Volunteers and Community Members on Museum History

See Appendix B for Preamble Script

Interview with Melvin Mantell

Category 1: Work at the Museum

1. How long have you been volunteering/working at the Walthamstow Pumphouse Museum?
2. How often do you volunteer/work at the Walthamstow Pumphouse Museum?
3. What made you start volunteering/working at the Walthamstow Pumphouse Museum?
4. What is your job at the Walthamstow Pumphouse Museums?

Category 2: History of the Museum

1. What information do you know regarding the history of the museum?
2. What pieces of history would you like to know more about in regard to the museum?
3. What do you like regarding how the history and exhibits of the museum are presented?
4. What do you think should be changed regarding how the history and exhibits of the museum should be presented?

Category 3: The Pump Station

1. How did you learn your technical background to restore the pumps?
2. Could you tell us about your personal history in the area?
3. Could you tell us about your past work in carpentry?
4. What past technology of the Walthamstow/Leyton area do you think lead the way for the greatest changes today?

Category 4: Improvements in the Museum

1. What would you like to see improved or updated in the museum?
2. What would you like visitors to take away from the museum?
3. What do you like regarding how the exhibits of the museum are presented?
4. If any, what interpretive devices would you like to see added to enhance visitor experience?

Interview with Frank Mycock

Category 1: Work at the Museum

1. How long have you been volunteering/working at the Walthamstow Pumphouse Museum?
2. How often do you volunteer/work at the Walthamstow Pumphouse Museum?
3. What made you start volunteering/working at the Walthamstow Pumphouse Museum?
4. What is your job at the Walthamstow Pumphouse Museums?

Category 2: History of the Museum

1. What information do you know regarding the history of the museum?
2. What pieces of history would you like to know more about in regard to the museum?
3. What do you like regarding how the history and exhibits of the museum are presented?
4. What do you think should be changed regarding how the history and exhibits of the museum should be presented?

Category 3: Fire Station

1. How was the museum able to obtain the materials featured in the fire station section?
2. Were you a firefighter in the Walthamstow Forest area?
3. Can you tell us more about the history of firefighting in this area?
4. Can you tell us about your experience as a firefighter?
5. What is your favorite experience from being a firefighter?

Category 4: Improvements in the Museum

1. What would you like to see improved or updated in the museum?
2. What would you like visitors to take away from the museum?
3. What do you like regarding how the exhibits of the museum are presented?
4. If any, what interpretive devices would you like to see added to enhance visitor experience?

Interview with the Neil Houghton

Category 1: Knowledge of the museum

1. How long have you known of the Pumphouse museum? When did you first hear about it?
2. What do you think the historical significance of the Pumphouse is?
3. What do you know about the history of the museum and the surrounding area?
4. Have you ever volunteered at the museum? What can you tell us about the early days of this museum?

Category 2: Background experience

1. Can you go into a little more detail explaining your experience as an archeologist and heritage professional?
2. Would you be able to explain your experience working for the Walthamstow Historical Society?
3. How does your experience working as a heritage professional add to your understanding of the museum and surrounding area?

Appendix F: Exit Questionnaire for Museum Visitors



Visitor Survey Walthamstow Pumphouse Museum

We are a group of students from Worcester Polytechnic Institute's (WPI) London Project Center. We are conducting this survey on behalf of the Walthamstow Pumphouse Museum to learn more about the visitor experience at the museum, and we appreciate your assistance. Your participation in this survey is completely voluntary and you may withdraw at any time. This survey should take around 5 minutes of your time. By completing this survey you consent that any information given can be used in our research. Please remember that your identity will remain anonymous, and all data will be reported anonymously in research reports and other outputs. Any personal data you choose to share with us will be stored securely and disposed of 29 June 2023 in line with the UK General Data Protection Regulation 2018. If you have any specific questions about this research please feel free to contact us at: lon_d23_pumphouse@wpi.edu. You may also contact our WPI project advisors, Lauren Elgert (lelgert@wpi.edu), Dominic Golding (golding@wpi.edu), and Sarah Riddick (sriddick@wpi.edu). If you have any questions about how the Walthamstow Pumphouse Museum uses data please email enquiries@walthamstowpumphouse.org.uk.



This section of the survey focuses mainly on demographic related questions. We are asking these questions to understand more about the profile of visitors at the Walthamstow Pumphouse Museum.

Please select 'prefer not to answer' if you would like to skip any questions in this section.

Please indicate where you live.

Please enter the first three characters of your postcode or include international locations if you choose other.

You may choose not to answer this question.

- E17 (Walthamstow)
- E18 (South Woodford)
- E11 (Leytonstone, Wanstead, Aldersbrook (part), Snaresbrook, Cann Hall)
- E10 (Leyton (part), Leyton Marshes, Temple Mills)
- E5 (Upper Clapton, Lower Clapton, Leyton (part), Stoke Newington (part))
- N15 (Tottenham, Harringay, South Tottenham, West Green)
- Other: _____

How many people are in your visiting party?

Your answer _____

Please indicate how many of each age group are in your visiting party. Should you prefer not to answer this question please leave the question blank.

	1	2	3	4	5	Over 5
Under 10	<input type="checkbox"/>					
11-17	<input type="checkbox"/>					
18-24	<input type="checkbox"/>					
25-34	<input type="checkbox"/>					
35-44	<input type="checkbox"/>					
45-54	<input type="checkbox"/>					
55+	<input type="checkbox"/>					

Please select your gender.

- Male
- Female
- Prefer not to answer
- Other: _____

Which of these ethnicities do you identify as, if any?

We are asking for this information in order to understand more about the profile of visitors of the Walthamstow Pumphouse Museum. Please select 'prefer not to answer' if you would like to skip this question.

- White
- Black/Black British
- Asian/Asian British
- Other
- Prefer not to answer

Selected ethnic group as: White

If you selected your ethnicity as White, please specify:

If you select 'Other' please specify

- English, Welsh, Scottish, Northern Irish, or British
- Irish
- Gypsy or Irish Traveler
- Roma
- Prefer not to answer
- Other: _____

Selected ethnic group as: Black/Black British

If you selected your ethnicity as Black/Black British, please specify:

If you select 'Other' please specify

- Caribbean
- African background (please specify in the next question)
- Other Black, Black British, or Caribbean background (please specify in the next question)
- Prefer not to answer
- Other: _____

If you selected 'African background', or 'Other Black, Black British, or Caribbean background', please specify below:

Your answer _____

Selected ethnic group as: Asian/Asian British

If you selected your ethnicity as Asian/Asian British, please specify:

If you select 'Other' please specify

Bangladeshi

Chinese

Indian

Pakistani

Prefer not to answer

Other: _____

This section focuses on questions regarding your visit at the museum today

Who are you visiting the museum with today? What is your relationship to them?

Check all that apply

- Family
- Friends
- School trip
- By myself
- Other: _____

What best describes the reason for your visit today?

Check all that apply

- Interested in the history of the local area
- Family day out
- Passing by
- Museum enthusiast – I love visiting museums
- Other: _____

How did you *first* hear about the museum?

- Website
- Friend or Family
- Facebook
- Instagram
- Twitter
- Maps (Google Maps, Apple Maps, TFL Maps, etc.)
- Advertisement
- Other: _____

Is this your first visit?

- Yes
- No

Returning Visitor

If you are a returning visitor, how many times have you visited in the past year?

- 1-3
- 4-5
- More than 5

This section focuses on questions regarding your visit at the museum today

Which of these best describe your experience at the museum today?

Check all that apply

- I enjoyed my experience at the museum
- The people with me enjoyed their experience
- I did not enjoy my experience at the museum
- The people with me did not enjoy their experience at the museum
- Prefer not to answer
- Other: _____

Based on your experience, would you consider returning to the Walthamstow Pumphouse Museum?

	Very Likely	Likely	Neither Likely or Unlikely	Unlikely	Very Unlikely	Unsure
→	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Based on your experience, would you recommend the Walthamstow Pumphouse Museum to others?

	Very Likely	Likely	Neither Likely or Unlikely	Unlikely	Very Unlikely	Unsure
→	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Which of these other museums have you visited?

Check all that apply

- Vestrey House
- William Morris
- Walthamstow Wetlands
- Markfield Beam Engine and Museum
- None

This section relates to your personal interest in the Pumphouse Museum

Please indicate your favorite part(s) of the museum:

Check all that apply

The Pumphouse (Main Bay)

The Firestation

The Tube Carriages

The Model Railway

The Engines

Arts & Crafts Area

All of it!

Other: _____

Please explain why:

Your answer _____

This section focuses on the features of the museum that help with your understanding of the exhibits

Regarding each section below, please indicate how strongly you agree/disagree that the museum should add more explanatory information.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	N/A
The Pumphouse (Main Bay)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Firestation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tube Carriages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Model Railway	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Engines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please indicate what kinds of additional information you would like to see:
If you would like more information for a specific exhibit, please indicate which in 'Other'

Check all that apply

- Information on how the museum obtained their collections
- More images/photographs
- Historical timelines showing progression of the technologies featured at museum
- Other: _____

When you visit other museums, which three (3) of the following do you prefer to use to learn about the exhibits?

Select up to three answers

- Text panels
- Hands-on Interactives
- Interactive Digital Information Screens
- Informational Video
- Staff-led Guided Tours
- Audio Guides
- Other: _____

How many text panels did you read during your visit?

- All
- Many
- Some
- Few
- None

Please indicate how strongly you agree/disagree with the following statements:
The text panels were...

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Easy to read	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fun	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Informative	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessible location	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Well lit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How interesting did you find the text panels in general?

	1	2	3	4	5	
Not at all interesting	<input type="radio"/>	Very interesting				

What feedback would you give to improve the text panels present at the Pumphouse museum?

Check all that apply

- Better Placement
- Better Lighting
- Less Text
- More Text
- Larger Font Size
- More Visual Accompaniment
- Other: _____

This section focuses on different ways to learn at the Walthamstow Pumphouse Museum.

Please indicate how likely you would be to take advantage of the following if they were available at the Pumphouse Museum

	Very Likely	Likely	Neither Likely or Unlikely	Unlikely	Very Unlikely	Unsure
Staff-led guided tour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Audio guided tour	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Digital information screens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Historical actors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Children's Activities Guide	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What else might the Pumphouse Museum do to improve the visitor experience?

Your answer _____

Appendix G: Focus Group Interview with Museum Staff and Volunteers

Preamble Script

Hello! We are a group of students from Worcester Polytechnic Institute (WPI), and we are conducting a research project in collaboration with the Walthamstow Pumphouse Museum in order to develop new approaches to interpretation for visitors of the museum.

Would you be willing to take thirty minutes in order to answer some questions regarding potential changes/additions to be made to the Pumphouse's _____ based on survey feedback results? This focus group should take about 30 to 45 minutes and is completely anonymous. You can request to stop the interview at any time, and may choose to not answer any of the questions. The focus group notes and any personal data you choose to share with us will be stored securely and disposed of by 29 June 2023 in line with the UK General Data Protection Regulation 2018. WPI and the Walthamstow Pumphouse Museum will produce research reports and other outputs using the data we collect from the focus group. We would like to attribute quotes to you and would ask for your approval of quotes we use prior to publication. However, we can report your feedback anonymously if you prefer. We are also happy to provide you with a copy of our full report upon completion if you would like a copy. Throughout this focus group we will ask you to write feedback on the prototype material that we have developed. The feedback received will be used to potentially improve the materials that we develop for our final product. Thank you so much for your support in this research.

Do you have any questions before we begin? If you have any concerns or questions after the interview, you can contact us at gr-lon_d23_pumphouse@wpi.edu or our WPI project advisors, Lauren Elgert (lelgert@wpi.edu), Dominic Golding (golding@wpi.edu), and Sarah Riddick (sriddick@wpi.edu).

Focus Group Questions for Text Panels

Category 1: Old/currently in use text panels

1. When looking at the text panels that are currently in use at the Walthamstow Pumphouse Museum, what about them do you like?
2. When looking at the text panels that are currently in use at the Walthamstow Pumphouse Museum, what about them do you dislike?
3. What changes would you like to see made to the text panels?
4. What do you think the biggest area of improvement for the text panels could be?
5. What are your thoughts on the layout of text panels in this section of the museum?
6. What are your thoughts on the supporting materials that are in use for these text panels?

Category 2: Newer/for potential use text panels

1. When looking at the “new” text panels that could potentially be used at the Walthamstow Pumphouse Museum, what do you like about them?
2. When looking at the “new” text panels that could potentially be used at the Walthamstow Pumphouse Museum, what about them do you dislike?
3. What is the biggest difference between the text panels that are currently in use, and these ones?
4. What are your thoughts regarding how these potential text panels are arranged?
5. What are your thoughts on the supporting materials that are in use for these text panels?

Category 3: Feedback from WPM staff

1. Would these “newer” text panels be more effective?
2. Do these “newer” text panels have accurate information?
3. Are they attention grabbing?
4. Are they concise?
5. Is the language used too technical, or difficult to understand?
6. Is the language too simple or not detailed enough?

Focus Group Questions on Children's/Family Museum Guide

Category 1: Thoughts on William Morris children's guide

1. This is an example currently in use on the William Morris' Galleries website. Are there items in this guide that you think would be effective for the Walthamstow Pumphouse Museum?
2. Are there items in this guide that you believe should be adjusted to better fit the Walthamstow Pumphouse Museum?
3. What do you like regarding how this guide is formatted? Worded?
4. Do you like the activities that are suggested in this activities guide?

Category 2: Children's/Family guide we've created

1. This is one example of a Children's Guide we have made. What do you like about it?
2. This is one example of a Children's Guide we have made. What do you dislike about it?
3. Do you think this guide reflects the most important aspects of each available exhibit?
4. This is the second example we have made. What do you like about it?
5. This is the second example we have made. What do you dislike about it?
6. Do you think this guide reflects the most important aspects of each available exhibit?

Category 3: Feedback from WPM staff

1. Would you like this to be implemented at the Walthamstow Pumphouse Museum?
2. Do you think the public would use these guides if they were made available?
3. Do these guides have accurate information?
4. Are they attention grabbing and interesting?
5. Are the words and language used easy to understand? Are they age appropriate?

Appendix H: Archival Materials

Documents from the London Metropolitan Archives

Document reference number: ACC/2558/EL/A/02/A48/006/33
Summary of document: One thing of potential relevance is a map of Low Hall Farm and the River Lea, early 1900s. There's also a lease for a Rev. Thomas James Thirlwall for 32 Bedford Row #6 that seemed interesting to look at. The text was difficult to read because of the handwriting but might provide some insight into ownership of the land.
Document #2 reference number: ACC 2423 R 51
Summary of Document: Walthamstow Bill 1934: maps of the Lea Valley from Tottenham to the Thames, and Walthamstow, showing water courses. Marks off an area called "Sewage Works and Farm (Now Disused)". Included various maps of waterways in 1934.
Document #3 reference number: ACC 2423 PP 17
Summary of Document: Railway Construction Maps. Map of where they planned to put the railways and stations in Walthamstow. Northeast London Rail Planning 1901.

Documents from the National Archives

Document reference number: MH13/242
Summary of document: These documents cover a diverse range of sanitary proceedings of various boroughs in London. There is a drawing of a sewage storage system present in this document, "sketch of a common privy constructed to meet my views. It would cost very little more than as of present constructed and if attended to for a few minutes every day all danger and nuisance would be removed and a great evil remedied" - May 26th, 1869, Cinderford Medical Officer of health Heane. Also, there was a focus on Walthamstow in regard to the Sanitary Act of 1866. In 1868 the Special Drainage District in Walthamstow was formed.

Documents from the Vestry House Museum Archives

Document reference number: Plan TQ 3587 NW (map)
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<p>Summary of document: Ordnance survey, February 1954 Shows St. James Street Ward. When put together with the three other maps it shows an interesting layout of Walthamstow.</p>
<p>Document reference number: Plan TQ 3587 NE (map)</p>
<p>Summary of document: Ordnance survey, February 1954 Mainly shows Low Hall Sports Ground and surrounding areas. When put together with the three other maps it shows an interesting layout of Walthamstow.</p>
<p>Document reference number: Plan TQ 3688 SW (map)</p>
<p>Summary of document: Ordnance survey, March 1955 This map shows the pumping station/Low Hall Farm Depot. When put together with the three other maps it shows an interesting layout of Walthamstow.</p>
<p>Document reference number: Plan TQ 3588 SE (map)</p>
<p>Summary of document: Ordnance survey, November 1953 More of the same. When put together with the three other maps it shows an interesting layout of Walthamstow.</p>
<p>Document reference number: W 35.22</p>
<p>Summary of document: An unpublished account of the families who owned the farm before it became council property in 1877. Accounts of ownership started in 1261. The original plot of land covered about 210 acres of land</p>
<p>Document reference numbers: M352; M354; M353; M865; LXXIII (73) 1 (Part) & 2 (Part); M335; M425; M343; M6; LXXVII (77) 12; M425</p>
<p>Summary of document: Maps ranging from the mid-1800s to the late 1900's showcasing the area of Walthamstow. Includes the location of the Pumhouse with various labeling including "Low Hall Farm" and "Low Hall Depot".</p>
<p>Document Description: Newspaper Article - Walthamstow Wonder</p>

Summary of document:

Article walks through the beginning development of the Pumphouse and the formation of the Friend of the Pumphouse. Quote from the article describes Lindsey and John Goodman: “John Goodman, an engineer who in his other spare time is the local Group Scout Leader. Lindsay and John then took me on a tour of their ‘baby’ - the Low Hall Farm Pumphouse, the lease for which they, through the support group - The Friends of Low Hall Pump House, are finalising with the local Authority.”

Document Name:

Research Notes

Summary of document:

Throughout the document were sheets of loose-leaf paper that delve into information regarding the material being looked at and simplify the documents present.

Document Description:

Pumphouse Article

Summary of document:

Magazine article delving into the details of how the “Pumphouse could become rail museum”.

Document Description:

Pictures of the Leyton and Leytonstone Fire Brigade and Engines.

Appendix I: Learning Hierarchy Model Worksheet

Learning Hierarchy Worksheet

Level 1: The Main Message

What is the overarching takeaway that visitors should leave the exhibit knowing? *Response in 1-2 sentences:*

Level 2: Themes throughout the Exhibit

What are 4 to 5 major themes that are present in the exhibit? What are the major takeaways from these themes?

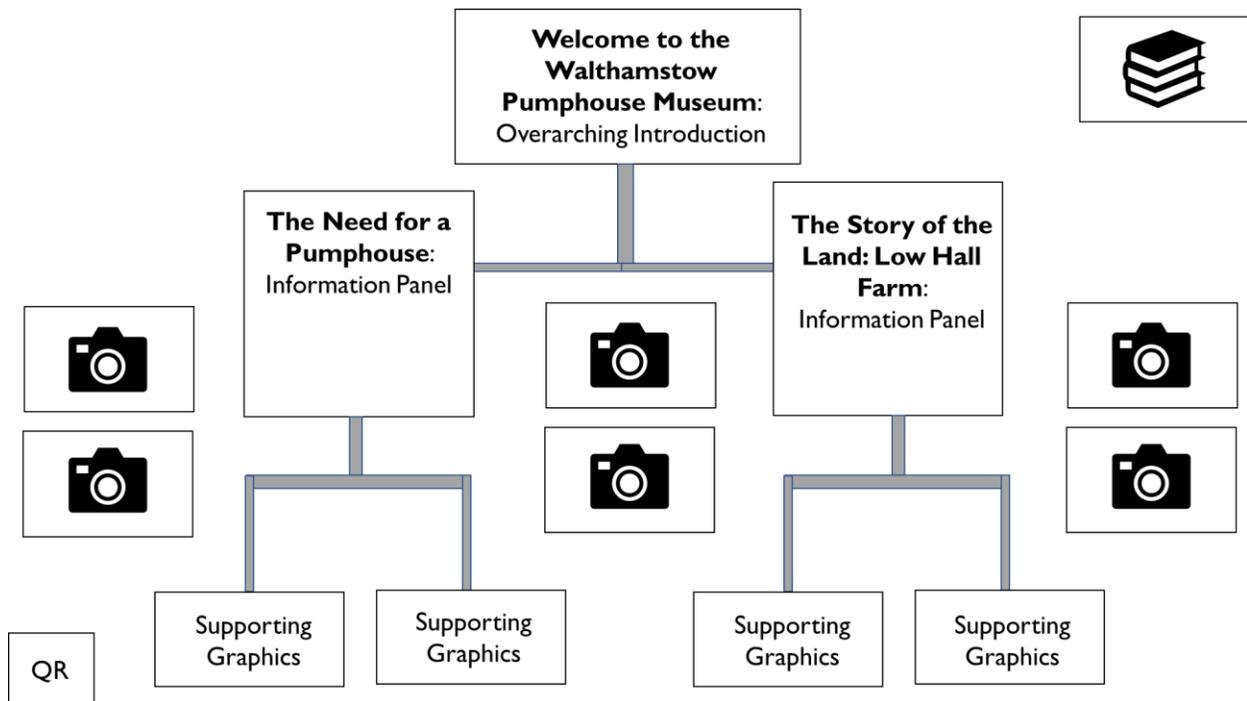
1. Theme 1
 - a. Takeaway
2. Theme 2
 - a. Takeaway
3. Theme 3
 - a. Takeaway
4. Theme 4
 - a. Takeaway
5. Theme 5
 - a. Takeaway

Level 3: Exhibit Sections

What are the more specific sections of the exhibit, and what are 3-5 major takeaways from these sections?

1. Section 1
 - a. Takeaway 1
 - b. Takeaway 2
 - c. Takeaway 3
2. Section 2
 - a. Takeaway 1
 - b. Takeaway 2
 - c. Takeaway 3
3. Section 3
 - a. Takeaway 1
 - b. Takeaway 2
 - c. Takeaway 3

Prototype Text Panel Board Layout for Introduction Board



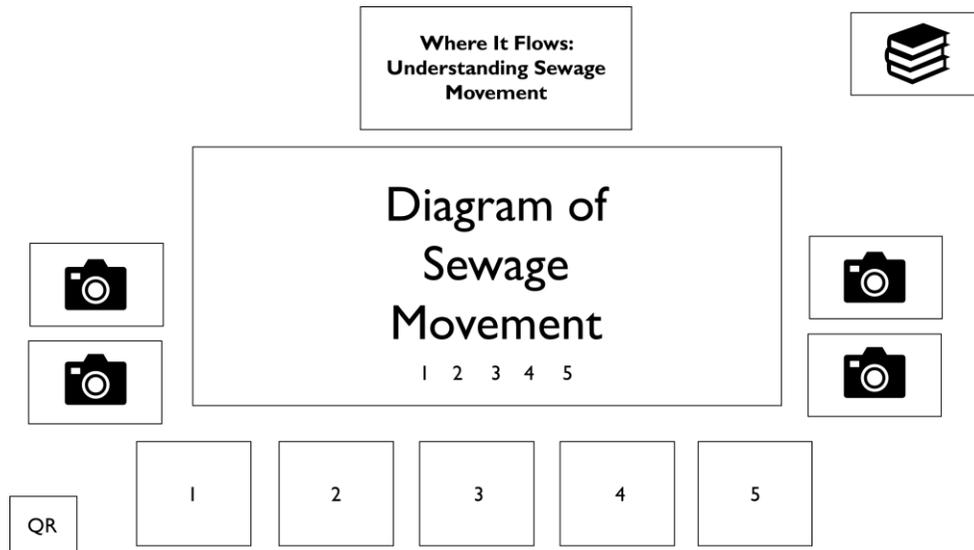
When designing this layout, we came up with three main learning outcomes we wanted visitors to come away with from what is being taught:

- The history of the land they are currently on in the history of Low Hall Farm.
- The situation that led to the creation of the Pumphouse.
- The understanding of what a Pumphouse is and what it does.

Key:

- The book symbol is representative of a vocabulary corner where more technical wording can be explained.
- The camera symbol is representative of areas in which graphic materials can be placed to support the text.
- The QR area is representative of a QR code that could be placed on the board and scanned by visitors who would like to learn more as well as provide access to audio recordings for greater accessibility.

Prototype Text Panel Board Layout for Sewage Board



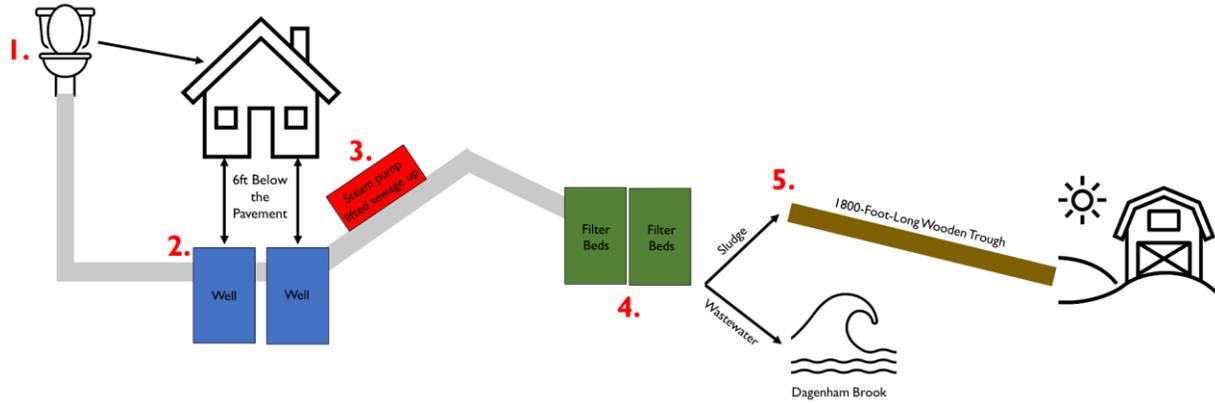
When designing this layout, we wanted to provide a way for visitors to visualize the movement of sewage with the supplementary text panels that are already present on the board. The numbering system for the text panels will allow visitors to quickly reference where they are in the diagram visually and what is occurring at that point through the text description. The learning outcomes we wanted visitors to come away with from what is being taught:

- The movement of sewage from homes to the pumphouse.
- The way in which sewage is processed.
- The scientific/engineering background and concepts related to the movement and treatment of sewage.

Key:

- The book symbol is representative of a vocabulary corner where more technical wording can be explained.
- The camera symbol is representative of areas in which graphic materials can be placed to support the text.
- The QR area is representative of a QR code that could be placed on the board and scanned by visitors who would like to learn more as well as provide access to audio recordings for greater accessibility.

Prototype Diagram of Sewage Movement for Text Panel Board



This figure showcases an example diagram that could be used in the text panel board layout for the Sewage Movement text panel. This diagram has labels for numbers 1 through 5, which correspond with text panels labeled 1 through 5 which would be found at the bottom of the board. The text panels would provide information to each of the specific highlighted points in the diagram.

The Story of the Land: Low Hall Farm

Did you know that the area you are in right now used to be farmland?

The land in which the Pumphouse stands was once a part of Low Hall Farm and Manor in mediaeval times.

The area of the Pumphouse once formed part of Low Hall Farm, which took its name from the nearby Low Hall Manor, a **14th century** moated country house. In Mediaeval times, Low Hall manor and farmland were considered **demesne lands**, meaning they were lands that were managed by the lord of the manor. Over the years, ownership of the land has changed multiple times. Walthamstow Urban District Council was able to obtain the land in **1877** from the **Bosanquet family** who were the lords of the Low Hall manor at the time.

Title (Limit 10 Words)

Teaser Question (10-20 words)

Brief Introduction/Headline Information (10-20 words)

Section information - This should be the longest and the most in-depth area of the panel. 50 to 100 words.

Important Notes:

- Highlight important words or dates to draw visitors attention and showcase the key items of the panel.
- If there are any words that are uncommon (ex. demesne lands) include a brief description or a teaser to describe the word.
- Supplement with graphics including photographs, diagrams, and maps.

Appendix L: Children's Activity Guide Prototype

Children/Family Museum Guide #1:

**WALTHAMSTOW
PUMPHOUSE MUSEUM**

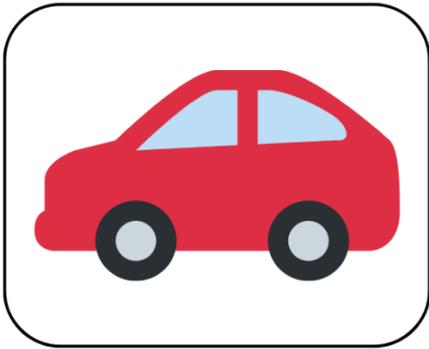
Children's Museum Guide

Exhibit Maps

The Pumphouse



Map(s)



There's a car engine in the Pumphouse! Find it and push the button to see how it works.

How do engines work?

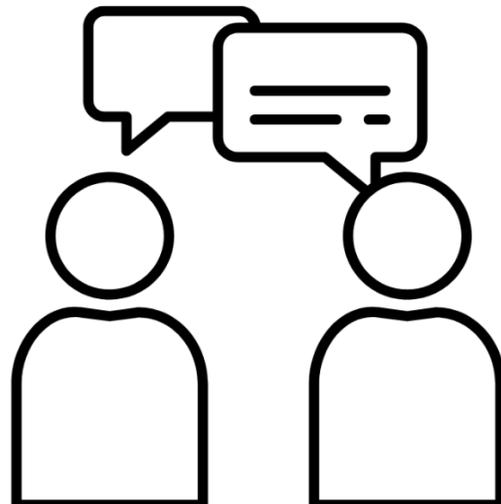
The engine consists of a fixed cylinder and a moving piston. The expanding combustion gases push the piston, which in turn rotates the crankshaft. Ultimately, through a system of gears in the powertrain, this motion drives the vehicle's wheels

What kinds of things can you hear? What can you see?

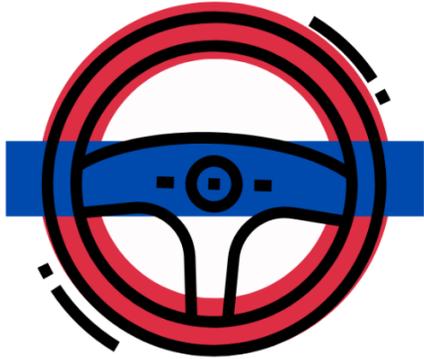


What did you learn about engines today?

Can you name two things an engine is needed for?



2



Have you ever driven a train? Take the Victoria line tubes for a spin!

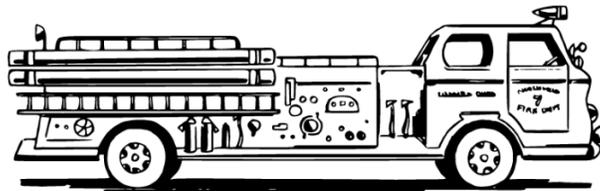
The first full-scale working railway steam locomotive was built in the United Kingdom in 1804 by Richard Trevithick, a British engineer born in Cornwall. This used high-pressure steam to drive the engine by one power stroke. The transmission system employed a large flywheel to even out the action of the piston rod.

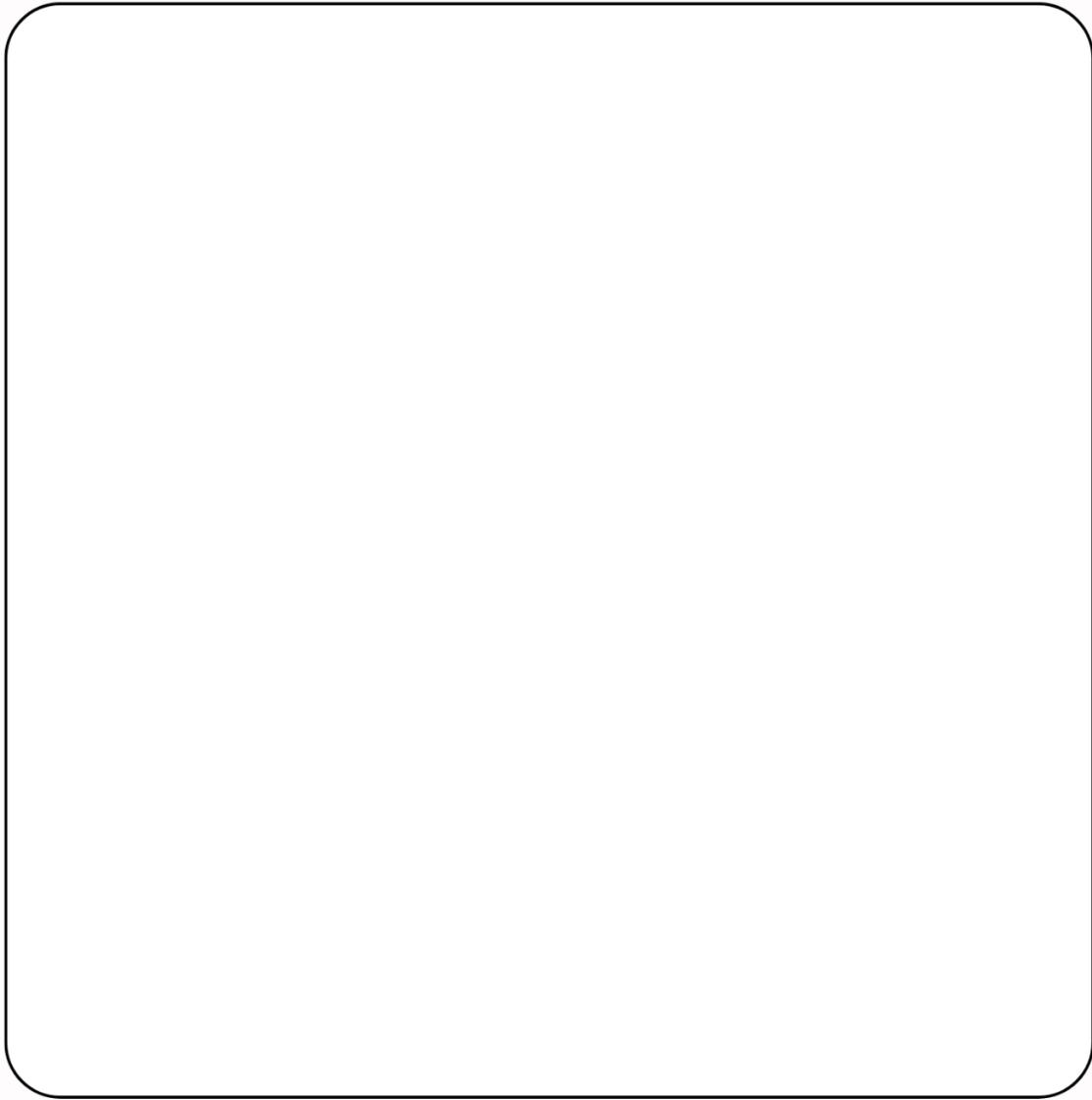


Talk to the volunteers in the fire station to learn all about firefighting!

List three things you learned about the fire station:







Create your best drawing of your favourite exhibit, and tag our Instagram!



@walthamstowpumphousemuseum

Children/Family Museum Guide #2:

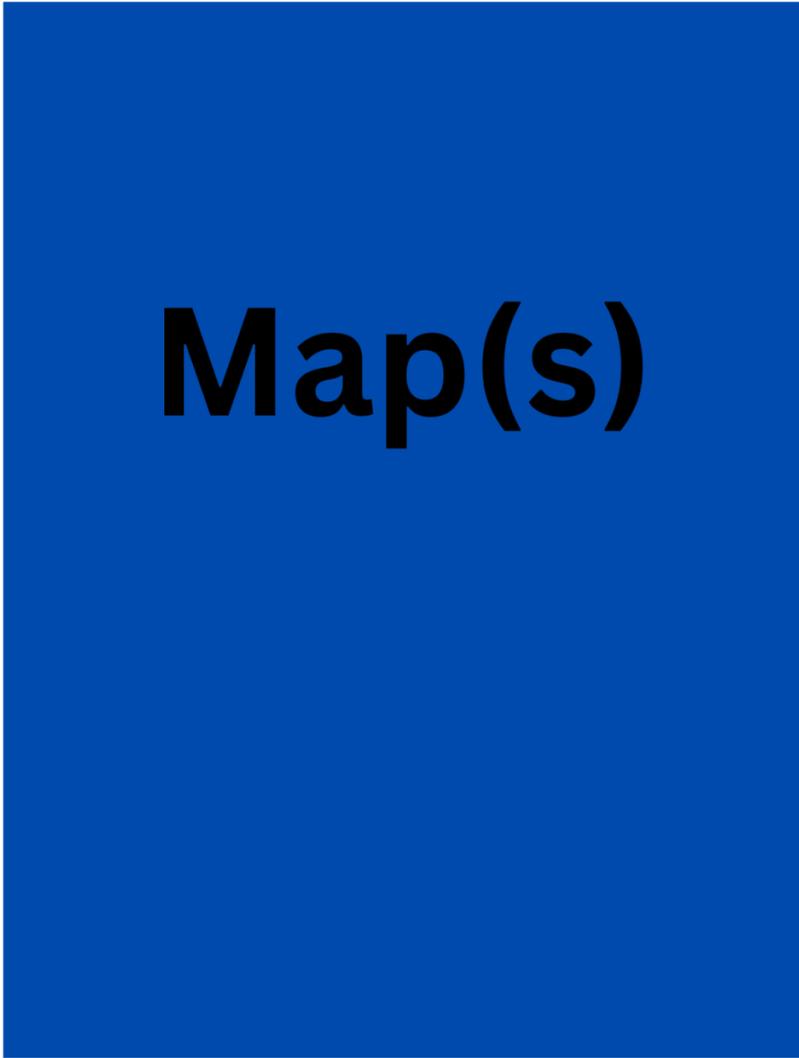
The Walthamstow Pumphouse Museum

FAMILY & CHILDREN'S
MUSEUM GUIDE



Exhibit Maps

THE PUMPHOUSE



Map(s)



THERE ARE SEVERAL ENGINES AND OTHER SIMILAR MACHINERY AROUND AND IN THE MAIN BAY OF THE PUMPHOUSE. THE IMAGE ON THE LEFT IS A CAR ENGINE.

SEE WHAT HAPPENS WHEN YOU PUSH THE BUTTON NEXT TO IT!

SHOWN BELOW ARE THE PUMPHOUSE'S MARSHAL STEAM ENGINES. THEY ARE THE ONLY SET OF STEAM ENGINES MADE BY THIS COMPANY IN THE WORLD TO BE TOTALLY PARALLEL IN DESIGN.



ALL OF THE EQUIPMENT AND EVEN THE FIRE ENGINE HAS BEEN BROUGHT TO THE MUSEUM BY ONE OF THE BELOVED VOLUNTEERS, FRANK.

THERE ARE MANY PIECES OF FIRE FIGHTING HISTORY HERE AT THE PUMPHOUSE, INCLUDING A REAL FIRE ENGINE THAT WAS ONCE IN USE!



IN THE FIRE STATION, THERE ARE MANY PIECES OF EQUIPMENT. SOME OF THE UNIFORMS, SUCH AS THESE SHOWN TO THE RIGHT, ARE FROM DIFFERENT COUNTRIES!

THESE UNIFORMS TO THE RIGHT ARE FROM AMERICA. GO INTO THE FIRE STATION TO SEE MORE!



HAVE YOU EVER WONDERED
WHAT HAPPENS TO
DECOMMISSIONED TUBE
CARRIAGES?

SOMETIMES, MUSEUMS LIKE
THIS ONE TAKE THEM!

THESE VICTORIA TUBE
CARRIAGES WERE ORIGINALLY
PUT TO USE IN 1967!



WHY DO THESE CARRIAGES LOOK SO
DIFFERENT?

BOTH CARRIAGES ARE FROM THE SAME YEAR
AND THE SAME LINE, BUT ONE OF THEM WAS
NEVER REFURBISHED!

THE MORE MODERN LOOKING CARRIAGE WAS
DECOMMISSIONED IN 2011, WHILE THE OLDER
LOOKING ONE WAS TAKEN IN AFTER A CRASH.