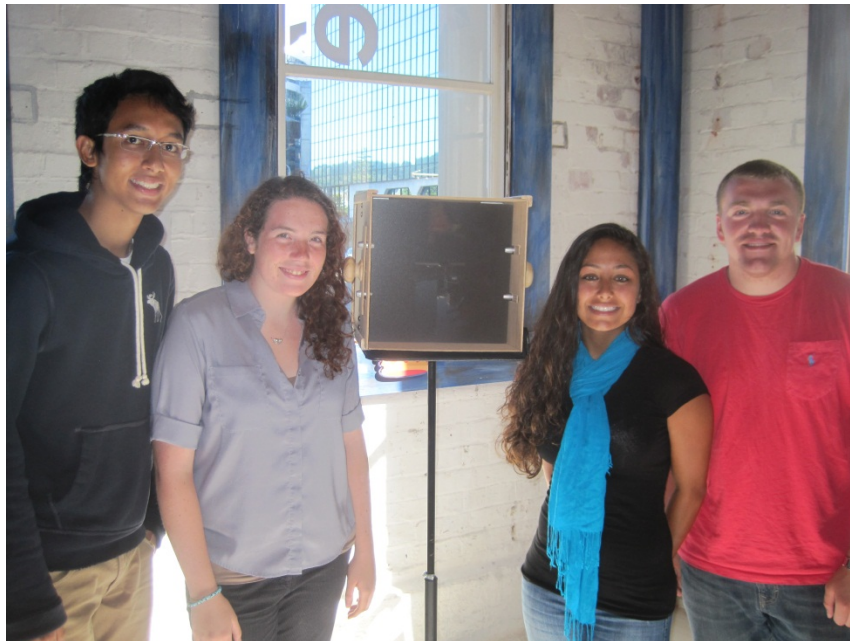


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# DEVELOPING A NEW PERSPECTIVE OF WELLINGTON'S CITY AND HARBOUR

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## A CAMERA OBSCURA EXHIBITION



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of Wellington  
City & Sea**



**Sponsor**  
Museum of Wellington City & Sea

**Date**  
28 February 2013



**WPI**

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# DEVELOPING A NEW PERSPECTIVE OF WELLINGTON'S CITY AND HARBOUR

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## A CAMERA OBSCURA EXHIBITION

*An Interactive Qualifying Project Report  
submitted to the Faculty of  
Worcester Polytechnic Institute  
in partial fulfillment of the requirements for the  
Degree of Bachelor of Science  
in collaboration with  
The Museum of Wellington City & Sea  
Submitted on February 28, 2013*

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## ABSTRACT

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The Museum of Wellington City & Sea wants to expand the *new ways of seeing* concept developed by the Wellington Museums Trust by installing a camera obscura exhibition. The goal of our project was to develop the supportive educational and interactive experiences and a marketing plan for a camera obscura exhibition at the Museum of Wellington City & Sea. We sought to accomplish this through interviewing museum staff, surveying and interviewing visitors, and building a camera obscura model to perform a formative analysis. Finally, we provided recommendations for a complete camera obscura exhibition including educational programmes, interactive supplemental material, and marketing strategies.

## EXECUTIVE SUMMARY

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The Wellington Museums Trust has initiated a ten year redevelopment plan to incorporate *the new ways of seeing arts, culture, heritage and Wellington* concept into the missions of the organizations that it represents. As part of this initiative, the Museum of Wellington City & Sea is incorporating a *new way of seeing* by developing a camera obscura exhibition to provide a fresh perspective on the Wellington area. A camera obscura, Latin for “dark room”, was the precursor to the camera. The technology itself is simple, using only the reflection of outside images to project a real-time display in a dark space. The camera obscura will take advantage of the museum’s location in the city to give a new view of activity outside.

The camera obscura exhibition is intended to build upon the historical exhibitions and add interactive and educational experiences for all visitors. Our goal was to develop the supportive educational and interactive experiences as well as a marketing plan for a camera obscura exhibition at the Museum of Wellington City & Sea.

### METHODOLOGY

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To incorporate these factors and achieve our goal, we developed the following objectives:

- Design an educational programme and experience for the exhibition.
- Incorporate engaging and interactive features in the exhibition.
- Build and evaluate a camera obscura model.
- Develop a marketing plan for the exhibition.

Each of these objectives we used carefully designed methodological strategies to gather the information necessary to form a full recommendation. To complete our first objective, we gathered information on education in a museum setting by interviewing museum staff, reading teacher evaluations of educational programmes, and surveying visitors in the Telling Tales exhibition. To complete our second objective, we observed visitors and conducted interviews regarding interactivity, entertainment, and material-learned in the Telling Tales exhibition. We achieved the third objective by choosing, building, and evaluating a working small-scale camera obscura model to gauge visitors’ reactions to its interactive aspects and the unique view it offers. Finally, to meet the fourth objective, we interviewed museum staff on current marketing and revenue strategies, surveyed visitors on media usage, and interviewed local tourism experts about tour popularity.

### FINDINGS AND ANALYSIS

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#### *Educational experience*

The educational programmes offered at the museum can be tailored to teacher requests and to meet the Learning Experience Outside The Classroom (LEOTC) requirements set by the Ministry of Education. Through reviewing education data and interviewing museum staff, we found that the best target audience for educational programmes is year-6 through year-8. We also discovered that more than half of the student groups visiting the museum were from the Wellington Region and Canterbury, on the South Island, is the second most represented region. The teacher comments revealed that the high levels of interaction and

hands-on experiences currently employed in programmes are highlights of the visit for both teachers and students. Additionally, we found that incorporating Science and Technology objectives from the New Zealand curriculum into the camera obscura exhibition would expand the museum past its social history focus.

Finally, to tie the exhibition back to the history of Wellington, we researched a Victorian Wellington photographer known as Zak. This historical connection will add to the educational experience for all visitors and ensure that the Victorian ethos of the museum is upheld. Below in Figure I is a Zak photograph of a camera obscura in Wellington in 1908.



**Figure I: Zak photograph of a camera obscura from the Christchurch Exhibition in Wellington.**

### *Interactive experience*

To find trends in visitor interaction and experience, each visitor interviewed was assigned a score based on their level of sensory engagement in the Telling Tales exhibition. We found that as a visitor's sensory score increased, so did their reported retention of information and entertainment from the exhibition. The teacher comments also revealed that the sensory experiences offered in the museum were enjoyable for both the students and the teachers, indicating that both adults and children benefit from the museum's current interactive displays.

### *Model evaluation*

We evaluated visitor interaction with the camera obscura model through observations, which revealed that visitors needed initial context to establish visitor comfort. Most visitors were curious about the phenomenon and interacted with the model to figure out how it worked. Figure II below shows the model we built.



**Figure II: Camera obscura model. Top: Translucent viewing screen showing an inverted image. Bottom Left: Side view of focus adjustment handles. Bottom Right: View of aperture and lens on front of model.**

### *Marketing plan*

Through museum staff interviews, we found that the museum pursues low-cost and resourceful marketing strategies to use the allocated budget efficiently. They capitalize on current events, create temporary exhibitions, and host well-known speakers or guests to promote the museum. The museum uses media, such as Event Finder, e-newsletters, and Facebook, to advertise these events in low-cost, long-term, and easily shared ways. Through our marketing survey, we found that most participants learned about the museum from signage, word of mouth, and brochures. However, participants answered that they mostly rely on television, Google, newspaper, and radio for advertising purposes. This reveals that these media could be utilized for the camera obscura exhibition as a more effective way to reach potential visitors.

Museum staff interviews revealed that proceeds from the retail shop and tours are the only sources of revenue for the museum. Some tours include transportation and multiple attractions for visitors, such as the Ship 'n Chips tour which is their most popular tour. However, we observed that visitors were rushed to each attraction which left little time to spend in the

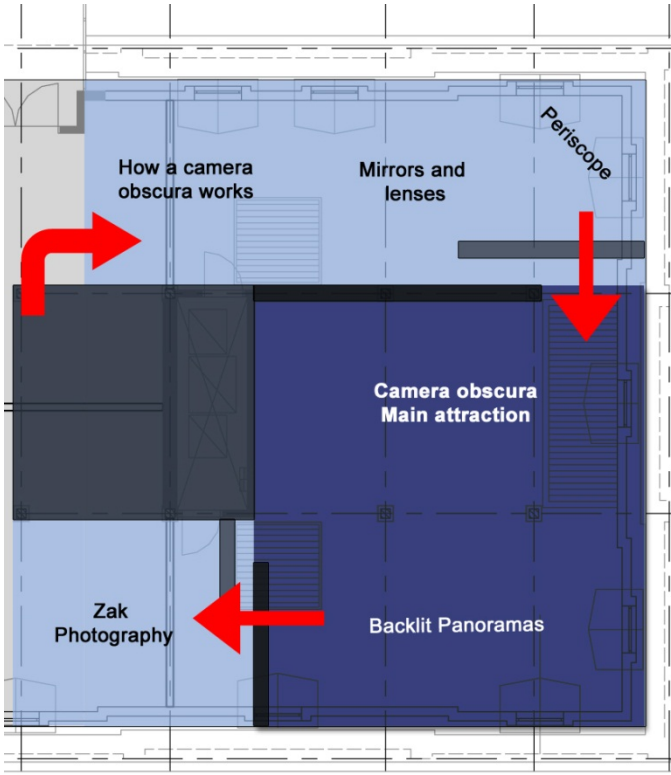
retail shop. Interviews with local tourist experts revealed that tours that include more attractions are generally more popular. We found that informative brochures, appealing posters, and informed sales staff are all effective ways of advertising tours. Through retail records, it was apparent that New Zealand branded items were the most popular and that coffee table books and stationary items designed with more pictures than text were successful. It was apparent through our analysis that using New Zealand branded and exhibition-specific stationary could potentially be a popular item in the retail shop.

**RECOMMENDATIONS AND CONCLUSION**

The recommendations for the interactive and educational experiences are presented in the order that a visitor would walk through the proposed camera obscura exhibition. Our recommended marketing plan includes marketing strategies and revenue generating suggestions.

*Education and interactivity in the exhibition*

As part of the museum’s redevelopment plan, the camera obscura exhibition will be located on the top floor of the museum which will be remodelled to have a layout similar to the other three exhibition floors. The exhibition is comprised of six segments which include an introductory diagram, mirror and lenses display, periscope, camera obscura main attraction, Wellington panoramic views, and historic Wellington photographs. We recommend that visitors move in a clockwise direction once they enter the top floor, as seen in the diagram in Figure III.



**Figure III: Proposed camera obscura exhibition layout.**

We suggest that the first segment provides a wall-mounted diagram and a description of the installed camera obscura to show how it works. This will explain the idea of the exhibition and the principles behind the camera obscura. As the visitor moves along, we recommend that the next segment of the exhibition features an interactive display involving mirrors and lenses. The purpose of this station is to teach visitors how the image in the camera obscura room is produced. The suggested mirror and lens display incorporates general interactivity and provides a hands-on learning method, which targets both hands-on learners and students that visit the museum. This segment can connect objectives from the Science and Technology learning areas of the New Zealand curriculum.

To encourage interaction within the exhibition, we suggest placing a periscope from the museum's Collection Store in the corner of the exhibition space. Since the windows in this section of the top floor are partially blocked, we recommend that the periscope looks at an artificial 360 degree panoramic view from Wellington harbour. This suggested feature was designed primarily for interaction and to offer a *new way of seeing* Wellington.

The next two segments of the exhibition are contained within a darkened space seen in Figure III. The visitors first come in contact with the camera obscura display. The museum is currently evaluating the option of either a window-mounted or a roof-mounted camera obscura for installation. For both options, we recommend providing interactive objects that can be engaging for visitors of all age levels. For the next segment located in the same darkened space, we suggest hanging several panoramic images of Wellington's city and harbour from the museum's Collection Store and other sources. We recommend printing the images as transparencies so they can be backlit in the dark room and provide a *new way of seeing* both photographs and Wellington. We suggest incorporating pictures from the past to present to allow visitors to reflect on Wellington's changes over time.

Finally, the exhibition will end with a segment about Joseph Zachariah, or Zak. This display will not only tell the story of Zak's photography, but also feature the stories of the buildings and areas that define Wellington today. Photos in this section can be paired with pictures of current-day Wellington in the same settings as his photos from a century ago. By doing this, visitors will be able to once again reflect on the changes Wellington has undergone over past years. This segment, as well as the panoramas in the dark room, will connect to the objectives of the Social Science learning area in the New Zealand curriculum for the educational programme.

Once visitors conclude their time in the camera obscura exhibition, they can continue on to the interactive activities table. To connect the two sections of the entire floor, we suggest developing camera obscura related activities for the interactive table. Ideas for these activities might include hands-on camera obscura models and build-your-own pinhole cameras. Both of these activities are interactive and can encourage children to explore how the camera obscura phenomenon works. Similarly, children could replicate a sketch of the view of the camera obscura at the interactive table and then match their drawing with the view in the camera obscura room.

### *Marketing plan*

To best market and promote the new exhibition, we recommend the museum advertise the opening of the exhibition on a large scale. We suggest reaching the target audience through



what we found to be the most effective local and social media, including television, radio and Facebook. To provide lasting solutions for promoting the exhibition, we recommend developing annual events, such as Zak's birthday celebration and designing exhibition-specific signage. To generate revenue, the next component of our marketing plan, we recommend developing stationary that is New Zealand branded and exhibition-specific, along with selling a coffee table book relating to the exhibition. Additionally, the museum can offer a paid tour including the camera obscura exhibition, a Wellington Cable Car ride, and the Carter Observatory.

### *Conclusion*

In sum, developing a new exhibition takes considerable planning and preparation. The idea of bringing a camera obscura exhibition to the museum invited us to reflect on and develop educational and interactive experiences and a marketing plan that would complement the Trust's *new way of seeing* concept. Since the exhibition is part of a larger redevelopment plan for the Museum of Wellington City & Sea, it was important to refer back to the *new ways of seeing* concept and to connect this vision to the social history theme of the museum. We believe our recommendations could engage visitors with thought provoking experiences, highlight the city and harbour through new attractions, and contribute to Wellington as the cultural capital.

## ACKNOWLEDGEMENTS

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- Mrs. Selena Murray for discussing the success of tours and general tourism in the Wellington area.
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- Prof. Ingrid Shockey and Prof. Michael Elmes, of Worcester Polytechnic Institute, for their continual input and advice for the entirety of our project.
- Worcester Polytechnic Institute for making this project centre and project possible in Wellington.

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## CHAPTER 1: INTRODUCTION

---

Wellington has a rich cultural past and a bright, promising future. The Museum of Wellington City & Sea is one of many historical buildings and museums in the waterfront district that melds the past and the present into the modern city landscape. The museum “presents stories of Wellington in fresh, innovative, and thought provoking ways, positioning the museum as a Wellington treasure and as one of New Zealand’s most innovative museums” (Museum of Wellington City & Sea Development Project, 2012). Since the museum building is an historical landmark, the mission incorporates the building’s original use while telling tales of Wellington’s past.

The museum’s curators maintain the traditional and historical visitor experience by implementing exhibitions that rely on Victorian technology to facilitate them. For example, one exhibition uses an illusionary technique called Pepper’s Ghost in which mirrors reflect special lighting to create virtual images on stage to tell Maori myths and legends (Museum of Wellington City & Sea, 2012). The museum is defined by a commitment to provide unique perspectives that optimize visitor experience through simple technology. This sets them apart from larger museums in Wellington that rely on modern technology.

The museum staff, in conjunction with the Wellington Museums Trust, has initiated a ten-year redevelopment plan to incorporate the *new ways of seeing arts, culture, heritage and Wellington* concept (Museums Trust, 2012). As part of this initiative, the Museum of Wellington City & Sea is incorporating a *new way of seeing* by developing a camera obscura exhibition to provide a fresh perspective on the Wellington area. A camera obscura, Latin for “dark room”, was the precursor to the camera. The technology itself is simple, using only the reflection of outside images to project a real-time display in a dark space. The camera obscura will take advantage of the museum’s location in the city to give a modern view of activity outside.

The camera obscura exhibition is intended to build upon the historical exhibitions and add interactive and educational experiences for all visitors. The idea was that visiting students could use the various educational materials provided to complement their learning outside of the classroom. The museum wanted a new perspective on the camera obscura exhibition for ideas and suggestions, so our team was asked to form a recommendation. Our goal was to

develop the supportive educational and interactive experiences and a marketing plan for a camera obscura exhibition at the Museum of Wellington City & Sea. We accomplished our goal by designing an educational experience relating to the New Zealand curriculum, incorporating engaging and interactive features in the exhibition, building and evaluating a camera obscura model, and developing a marketing plan for the exhibition. The next section outlines the literature that we reviewed to gain the background information necessary to complete our recommendation.

## CHAPTER 2: LITERATURE REVIEW

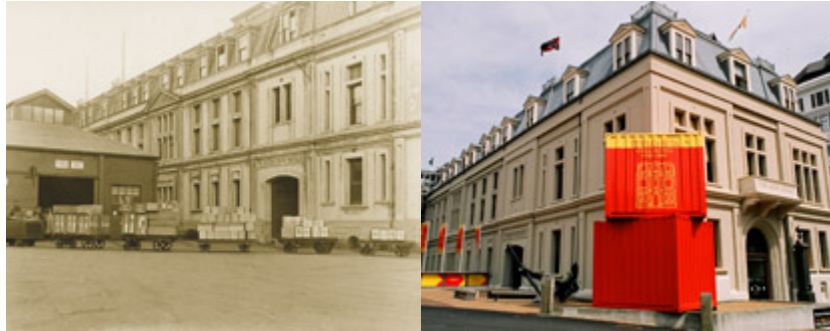
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In this chapter, we review the history of the camera obscura, educational and interactive aspects of an exhibition, successful museum marketing strategies, and our case study of a camera obscura exhibition to establish a foundation for our project. We describe the *new ways of seeing* concept developed by the Wellington Museums Trust and its relevance to the camera obscura exhibition. We then discuss how the camera obscura exhibition could incorporate the New Zealand curriculum while offering an interactive and engaging experience. Next, we review several marketing strategies and revenue generating activities that are important for museums. Finally, we present a case study about our team's experience at the Children's Museum and Theater of Maine. We begin this chapter with a description of the Museum of Wellington City & Sea.

### 2.1 SITE DESCRIPTION

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Wellington is the capital of New Zealand and is located on the southern tip of the North Island. The city was built on a harbour, but its limits extend far past the downtown region. The waterfront district celebrates Wellington's culture through historical buildings and museums that meld the past and the present into the modern city landscape. The Museum of Wellington City & Sea is an historical museum that opened on the harbour in 1999 following extensive restoration and conservation of the original building, the Bond Store, which was erected in 1892 (Museumswellington.org.nz, 2012). This museum celebrates Wellington's cultural and maritime history while also being an historical landmark itself. It provides an intimate and educational representation of the harbour and the city of Wellington as seen below in Figure 1.



**Figure 1: Original Bond Store and the present Museum of Wellington City & Sea (Museumswellington.org.nz, 2012).**

The museum is associated with other museums and attractions in Wellington through Museums Wellington and the Wellington Museums Trust. Museums Wellington is a collection of institutions that are committed to telling Wellington’s stories. It is comprised of the Cable Car Museum, Colonial Cottage Museum, Carter Observatory, and the Museum of Wellington City & Sea. The Wellington Museums Trust was established in 1995 by the Wellington City Council and is made up of the Museums Wellington institutions along with City Gallery Wellington, Capital E, and New Zealand Cricket Museum. The vision of the Trust is to have “Wellingtonians and visitors to the city experience *new ways of seeing arts, culture, heritage and Wellington*” (Museums Trust, 2012). The Trust hopes to achieve their vision through accomplishing several different objectives. The first is to engage visitors “in thought provoking experiences that achieve high standards of quality, critical acclaim and public participation and appreciation” (Museums Trust, 2012). The second objective directs museums to build “on individual strengths including city and harbour locations to maximise opportunities to deliver great visitor experiences across the city” (Museums Trust, 2012). The Trust’s third objective is to “make a compelling contribution to Wellington as the cultural capital” (Museums Trust, 2012). Finally, the Trust wants their organization to be financially sustainable (Museums Trust, 2012). The Trust’s vision was used as a guideline for the camera obscura exhibition to ensure that these objectives were achieved and the proposed exhibition provided a *new way of seeing* for visitors.

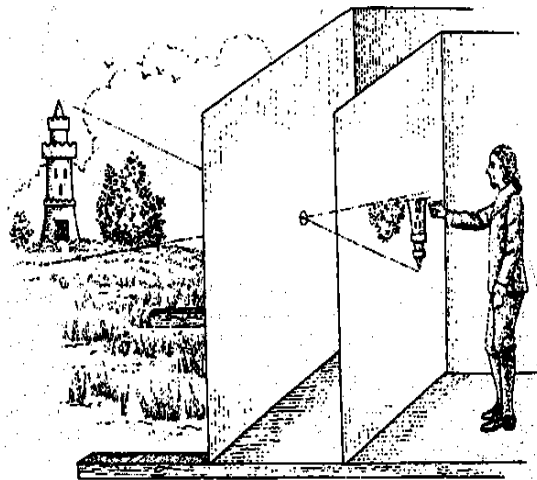
The Museum of Wellington City & Sea educates visitors on the historical events that ultimately moulded Wellington into what it is today. As part of the Trust’s initiative, the

museum is developing a permanent exhibition featuring a camera obscura. The view of Wellington offered by a camera obscura could provide an educational experience that allows visitors of all ages to reflect on how major events in the waterfront's history have formed the present day city. Furthermore, the museum hopes to use this new exhibition as an opportunity to generate revenue and attract more visitors and school groups. The museum does not currently charge visitors an admission fee; however, they do generate revenue from tours, parties, and merchandise in the retail shop.

## 2.2 OVERVIEW OF THE CAMERA OBSCURA

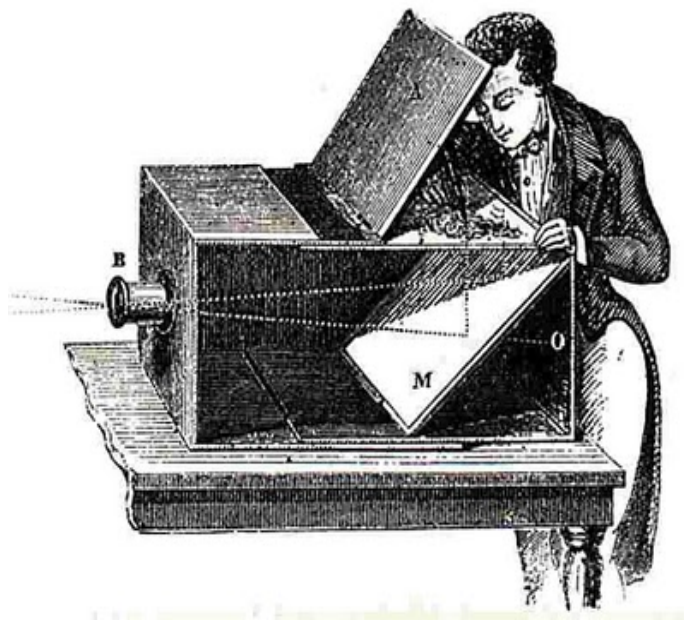
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As early as Ancient Greece, scientists and artists uncovered the phenomenon now known as the camera obscura. Since its invention, the camera obscura has been used for several different purposes, ranging from astronomy to art. Aristotle was the first to experience this phenomenon when he observed that a light passing through a small hole had produced an inverted image of the outside world, as seen in Figure 2 (Edinburgh's Camera Obscura, 2012).

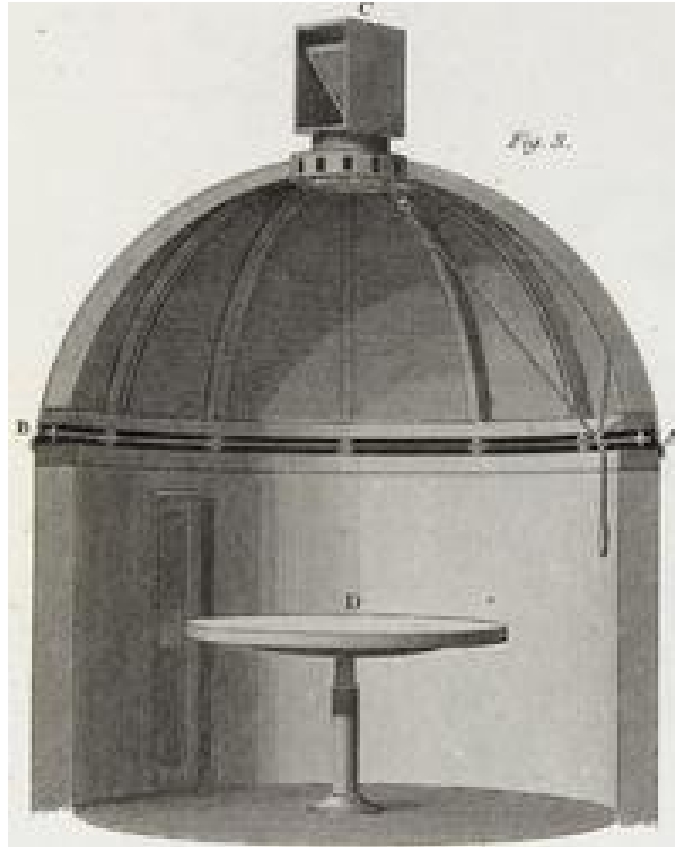


**Figure 2: Early camera obscura using a small hole to produce an inverted image (people.wcsu.edu, 2012).**

During the 13th Century, astronomers such as Roger Bacon and John Pecham used these cameras as standard devices for observing solar eclipses and other astrological phenomena (Fiorentini, 2006). The main drawbacks of the camera obscura were in the quality and inversion of the projected image. However, the invention of convex and concave lenses and the further development of optics were able to solve these problems, enabling the image to appear upright and be properly focused. Despite the simplistic nature of the mechanism, the image can put objects into focus that are nearby or far away. By adding an array of lenses and mirrors, called the objective lens, the focal point of the projected image can be changed. Different combinations of the lenses and mirrors provide several different designs for a camera obscura. Figure 3 and Figure 4 depict camera obscuras that use two different types of objective lenses; Figure 3 uses a single mirror that focuses objects in close proximity allowing an artist to sketch an image with great detail, while Figure 4 shows a camera with a large objective lens that can focus distant images and project the surroundings onto a round table.



**Figure 3: Portable camera obscura (thedelightsofseeing.blogspot.com, 2012).**



**Figure 4: Diagram of table camera obscura**  
(A. Rees Cyclopaedia, Universal Dictionary of Arts and Sciences, 1786).

By the 16th Century, artists used the camera obscura as a tool to provide added detail and perspective to their drawings. In the 17th Century, Johann Sturm, Johann Zahn and Georg Brander developed the box-type camera obscura, seen in Figure 3, which provided artists with the mobility they needed for their work (Fiorentini, 2006). These innovations provided invaluable aid for artists and ensured the continued development of the camera obscura.

Currently, Edinburgh's Camera Obscura, the Royal Observatory Greenwich, and Torre Tavira are sites that include large objective lens camera obscuras that display and encourage learning from the surrounding environment. The camera obscura offers “a fascinating and highly amusing way to see the city and learn about history” for the exhibition’s visitors (Edinburgh’s Camera Obscura, 2012). The guides at Edinburgh’s Camera Obscura use it to tell the story of Edinburgh, both past and present, in an engaging and informative way.

## 2.3 DEVELOPMENT OF AN EXHIBITION-SPECIFIC CAMERA OBSCURA

The Museum of Wellington City & Sea contacted KiwiStar Optics in the fall of 2012 to discuss the design and manufacturing of a camera obscura instrument to be installed on the museum's roof. A camera obscura was found at the Napier National Aquarium and was considered for refurbishment. This camera obscura consisted of three independent optical systems mounted mutually at 120 degrees that could create a 360 degree panorama of the outside image.

KiwiStar Optics responded with a preliminary report outlining the condition of the instrument and the approximate cost of refurbishment and installation. It was found that the lens surface was stained to the extent that it etched the glass, which can cause the projected image's contrast and quality to decrease. It was also found that the drive shaft of the rotating turret was inoperative and that new drive motors, bearings, and drive shafts would be required to make the turret operational again (KiwiStar, 2012).

Based on KiwiStar Optics, the estimated price for the refurbishment of the camera obscura was NZ\$126,480. This figure included the complete refurbishment of the optical system as well as the main housing but did not include the repair or refurbishment of the rotation drive for the turret. From a mechanical stand point, the camera obscura was deemed feasible, given the integrity of the optical systems, space requirements and clearance of the HVAC system on the roof. Although the camera was deemed feasible, the Museum of Wellington City & Sea decided not to refurbish this instrument. Positioning the camera above the HVAC system could cause vibrations and increase cost due to the strong winds and weather conditions in Wellington.

Therefore, the museum determined that a purpose-built instrument needed to be developed to meet their restrictions. They proposed two options for the camera obscura: a roof-mounted or a window-mounted instrument, both of which would provide a total viewing angle of seventy degrees. The roof-mounted camera obscura would project the image onto a round table, while the window-mounted camera obscura would project it onto the opposite wall. The museum and KiwiStar Optics are continuing to negotiate designs based on the needs



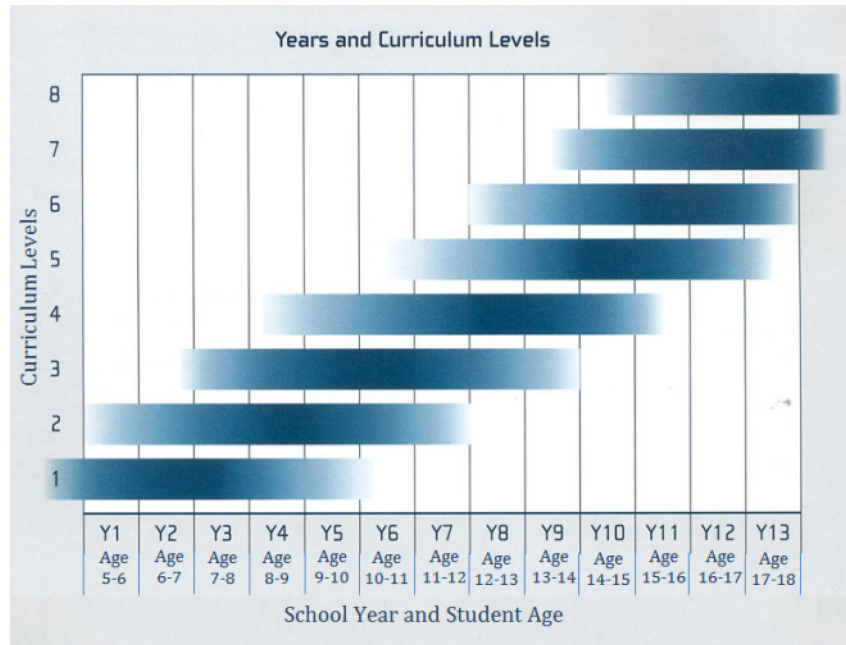
and limitations of the museum. The museum will make a decision about which design will be implemented in the exhibition at a later date.

## 2.4 MUSEUM EDUCATION AND THE NEW ZEALAND CURRICULUM

In order to understand which educational components should be incorporated into a museum exhibition, we researched the New Zealand curriculum and education system, the requirements for museum educational programmes, and the visitor's overall educational experience. Because museums act as a supplemental educational source for formal schooling, modern museums often attempt to follow guidelines of the national curriculum (Haywood & Cairns, 2006). Museums have the capacity to integrate specific aspects of a curriculum into exhibitions to build directly upon formal schooling parameters. The Museum of Wellington City & Sea can enhance its educational experience for visitors and students by incorporating not only components of the national curriculum, but also diverse learning strategies.

### NEW ZEALAND EDUCATION SYSTEM

The New Zealand education system is comprised of school year-1 through year-13; students move up in year at the end of each academic year. Students begin school at age five and end at age eighteen. In addition to school year, students are categorized by curriculum levels one through eight. However, students do not necessarily move up in level at the same time they move up in school year (The New Zealand Curriculum, 2007). Figure 5 shows the typical overlap of school year and curriculum level along with the ages associated with each school year.



**Figure 5: New Zealand educational system: the school years and student ages that correspond to each curriculum level. Adapted from: (The New Zealand Curriculum, 2007).**

Due to this overlap, teachers with classrooms comprised of one or two school years could be teaching multiple curriculum levels. The purpose of this system is to ensure that students working at lower curriculum levels will still be in the same school year and learn with their peers.

### LEARNING EXPERIENCE OUTSIDE THE CLASSROOM SERVICES

The Museum of Wellington City & Sea is already designated as a Learning Experience Outside The Classroom (LEOTC) provider. Because LEOTC providers receive funding from the Ministry of Education, the LEOTC providers must adhere to the structure and requirements set by the Ministry of Education in order to maintain their funding. LEOTC services revolve around developing a cohesive programme for students where both teachers and museum educators share common goals and objectives. These services must also allow for students to have interactions and experiences that teachers cannot provide within a classroom setting (LEOTC Provider Guidebook, 2008). It is required that LEOTC services have pre- and post-visit communication between the providers and teachers to ensure there is effective learning within the programmes. Because of this and other requirements, LEOTC services are closely aligned

with both national and classroom curriculums and must “provide hands-on and interactive learning experiences which are memorable and promote the transfer of skills and understandings across learning areas and within the context of students’ everyday lives” (LEOTC Provider Guidebook, 2008, p.3). In addition, LEOTC services must also accommodate diverse learning ranges (LEOTC Providers Guidebook, 2008). All of these requirements are intended to help LEOTC services achieve the Ministry of Education’s goal to “equip all New Zealanders with the knowledge, skills and values to be successful citizens in the 21st century” (LEOTC Provider Guidebook, 2008, p. 3).

## RELEVANT KEY COMPETENCIES

The New Zealand Curriculum focuses on key competencies, four of which are relevant to this project, and emphasizes how these skills relate knowledge, attitude, and values. The key competencies are not factual subject material for students to learn, but rather are life skills that are applicable to students and general museum visitors. One competency is ‘thinking’ which focuses on using creative, critical, and metacognitive processes (Key Competencies, 2007). It encompasses problem solving, reflecting on what has been learned, and drawing from experience and knowledge to challenge and ask questions. A second competency is ‘using language, symbols, and texts’ along with comprehension skills (Key Competencies, 2007). Symbols and text can be perceived through several learning methods such as written, oral, and visual communication. Another competency is ‘relating to others’ (Key Competencies, 2007). This is critical for effective communication and interaction. Being able to critically evaluate a situation and effectively examine all viewpoints of an issue comes from being able to effectively communicate and interact with diverse groups. The final relevant competency is ‘participating and contributing’, which in tandem with relating to others, allows for communities and relationships to develop (Key Competencies, 2007). In addition to collaborating and contributing, this competency stresses the need for balance of responsibility and roles within group dynamics (Key Competencies, 2007). Because these competencies are intended not only for school pupils but also the community at large, applying these competencies to a museum exhibition allows the goals to reach the entire target audience. An exhibition that incorporates

interactive activities and educational experiences could be easily related to the New Zealand curriculum.

## KEY LEARNING AREAS

In addition to the key competencies, the New Zealand Curriculum outlines key learning areas, or subjects. For each learning area there are objectives that outline the specific knowledge topics for that subject. For the camera obscura exhibition, the learning areas that were relevant included Science, Social Science, and Technology.

Objectives pertaining to the Science learning area include exploration through physics, physical concepts, physical inquiry and physics concepts. Through these objectives, students are able to effectively master the physical world, one of the fundamental aims of the New Zealand science curriculum (Science, 2007). The two main goals of the Social Sciences learning area are to expand the understanding of “place and environment” and “continuity and change” (Social Sciences, 2007). The mastery of these objectives allows students to develop an understanding of their surroundings and the way the surroundings have effectively changed over time which can be related to the camera obscura exhibition. The Technology learning area objective that applies most to the camera obscura is “technological knowledge” (Technology, 2007). “Technological knowledge” includes comprehension of how and why things work and ultimately how larger systems and operations function (Technology, 2007). Since the camera obscura is a relatively simple machine, visitors can learn generally how the mechanisms function together.

## 2.5 TRACKING VISITOR ENGAGEMENT

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In addition to incorporating the New Zealand curriculum into the camera obscura exhibition, we needed to track visitor engagement. There are several aspects of museum exhibitions that come together to form an attractive, educational, and well-balanced visitor experience. Below we reviewed what experts in the museum field have identified as important to include in exhibitions.

## TARGET AUDIENCE AND THEIR COMFORT LEVEL

A museum's ability to choose and accommodate to a target audience are two of the first steps associated with establishing a new exhibition. To ensure the museum provides visitors with a rewarding experience, a target audience is identified for each exhibition by examining leisure preferences, education levels, ethnic and social affiliations, and several other criteria to choose the target audience (Dean, 1996). While the New Zealand curriculum can be incorporated into an exhibition that targets a certain age group to ensure optimal learning opportunities, the exhibition still needs to be enjoyable and educational for the general public outside of the target group.

After a target audience is chosen, experts that evaluate visitor engagement point to *visitor comfort* to ensure an enjoyable and worthwhile visit (Dean, 1996). An exhibition that is too informal, for instance, if it does not offer a plan to explore the exhibition or does not offer a purpose for the exhibition, can be uncomfortable for visitors and detract from their experience. However, when an exhibition is too formal, it can require excessive educational background or analysis of material to garner educational value for the average visitor. This can isolate visitors and lead them to experience the exhibition as cold and distant (Dean, 1996). Since the learning experience is ultimately up to the visitor, a complementary balance between informal and formal exhibition settings should be the goal. A balance will fulfil the comfort level desired by producing an environment where visitors have the desire to learn while being able to grasp the material well (Dean, 1996). Without *visitor comfort*, the exhibition may be quickly passed over without providing a new perspective or educational value which have been the two main objectives for the camera obscura exhibition.

Comfort can be addressed through the presentation of information in the exhibition. Signs leading to and within an exhibition should have an easy to read format to ensure people have *mind comfort* (Weaver, 2007). *Mind comfort* is visitor's comfort in learning the information provided by the exhibition rather than physical comfort in the surroundings. People are generally more motivated when they can receive the greatest reward for the least amount of effort (Weaver, 2007). In relation to museums, aesthetically pleasing signs that promote *mind comfort* can be incorporated for visitors. While making the information accessible to all

visitors, the exhibition should also provide a comfort when using technology. Using simple mechanics for an interactive exhibition ensures that visitors will feel comfortable participating, and since the Museum of Wellington City & Sea uses Victorian Era technology, simple mechanics are already incorporated into their exhibitions. The camera obscura, as a simple, uncommon technology, can encourage visitors to engage in the exhibition, while signs with high readability can provide visitors with easy access to additional educational material (Weaver, 2007).

## EXHIBITION LEARNING EXPERIENCE

Museums aim to engage all five senses to enhance visitor experience and retention of information. An easy way to enhance an exhibition through sound is by adding music or specific sound effects relating to the information provided. Research shows, that if the exhibition has high reading content throughout, music without words should be played, but if the exhibition involves solving puzzles or observation, lyrical music is a great way to incorporate another sense (Dean, 1996). Also, permission to physically touch the exhibition engages the visitor in another sensory activity. Through interactive and engaging exhibitions, museums provide a more stimulating experience that fosters a higher rate of retention of the material learned. However, visitors will not want to interact with a display if they feel like they may break it, or if it is not useable for all age groups. Therefore, easy to use interactive features should be designed and incorporated into an exhibition.

Through our review of the literature, it was also apparent that visual appeal should be incorporated in every exhibition. Using creative colouring, lighting, and contrasts gives visitors an intensified experience. By using extremes like large and colourful displays along with moving or novel objects, museums have the ability to capture the attention of many more visitors. The camera obscura exhibition for example, has the potential to be a bright projection of the Wellington area in an otherwise dark room providing a stimulating contrast and a moving display. Meanwhile, the supplemental material for the exhibition can also incorporate colourful displays and novel, low-technology interactive features to further engage visitor interest (Weaver, 2007; Dean, 1996).

Finally, the literature revealed that social context governs group dynamic of interactive exhibitions through socio-cultural mediation of individuals, groups, and others (Chang, 2006). This context can be greatly modified by the presence of museum docents, guides, and school programme facilitators (Haywood & Cairns, 2006; Chang, 2006). Parents can highlight sections of the exhibition for their children providing a positive social context while a group of students joking or mocking could create a negative social context. Although this is hard to control with the design of an exhibition, it is important for the scheduling of school tours and general visitor tours to ensure they do not overlap. In sum, attention to sensory details in an exhibition is important for promoting learning, retention of information, and overall enjoyment for visitors attending the museum which ultimately add to the educational experience.

## 2.6 MUSEUM MARKETING

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Marketing the experience offered by a museum means convincing the target audience that a visit is worthwhile (Mclean, 1996). To relay the mission of the museum to the public, the staff and environment must be in tune with that mission (Mclean, 1996). Being able to provide the visitor with a consistently interesting and accessible experience can promote the museum and form the basis for a marketing campaign. Meanwhile, providing an environment where visitors can interact with staff members to learn and be entertained can promote the goal of the museum beyond its walls.

### MARKETING FOR A TARGET AUDIENCE

Museums often try to reach out to everyone with their marketing campaigns and promotions. However, research indicates that museums benefit more from appealing to their target audience and building from there (Weaver, 2007). A marketing campaign will be more successful if it can relay experiences offered at the location that directly relate to the target audience's interests (Weaver, 2007). The Museum of Wellington City & Sea's visitor demographic records shows that its visitors are usually less than thirty-five years old revealing a relatively young target audience (Museum of Wellington City & Sea Development Project, 2012).

Recent studies suggest that the new generation of visitors, like the museum's target audience of below thirty-five years old, prefer a more interactive and entertaining experience from museums. Meanwhile, the entertainment industry has become more involved with education through television programming and electronic gaming, making it a competitor as a supplemental education source to museums (McNichol, 2005). Therefore, many museums have begun to place more emphasis on entertaining visitors instead of just educating them (Gilmore & Rentschler, 2002). Hence, creating marketing campaigns that focus on unique, interactive, and entertaining aspects of the museum can better appeal to younger visitors.

## MUSEUM PROMOTION

Another way to promote a museum is through affiliation. Museum affiliations in the Wellington area are common because these associations are beneficial for funding and intra-museum relations. However, museums may find that their individual identity is diluted through multiple associations. When a marketing campaign includes several organizations or divisions, it can be confusing for potential visitors and limit the effectiveness of the campaign. To clarify this problem, a museum can establish a consolidated and recognizable brand which is especially important for marketing specific exhibitions within its own facility. An effective way of doing this is developing one logo or brand that gives the public an accurate idea of each museum's mission. When using this brand, all promotional documentation that a museum publishes will be coherent and aligned to further define the brand's mission (Weaver, 2007).

A promotion or communication campaign can be used to raise awareness, which is particularly important for museums promoting new products. Once the market becomes aware of what is offered, the promotion campaign must inform potential visitors of the benefits from the experiences offered. Only then can the potential visitors request these experiences and reap the benefits. Therefore, it is important that a museum maintains a promotional campaign to remind potential visitors, and even past visitors, what they have to offer (McClean, 1996).

The media that is used for a promotional campaign depends on the museum's resources, funds, and audience. Many museums do not budget for marketing expenses even though it is an integral part of gaining new visitors (McClean, 1996). Unfortunately, marketing



campaigns can be very expensive, mostly due to advertising costs; however, the benefits usually outweigh the costs, if implemented effectively.

Promotion and its costs are dependent on both the target audience and the museum's surroundings. For instance, in areas of greater competition or fewer possible visitors, experts suggest that a museum spend more of its marketing budget on promotional literature and advertising (McClean, 1996). A few commonly used advertising media include newspapers, television, radio, outdoor advertisements, direct mail, and magazines. Mail advertisements sent directly to the target audience are considered to be the most effective; however, they can be the most expensive. Television and radio are also very effective in reaching an audience, but can be just as expensive as direct mail. The cheapest forms of advertisement are usually magazines and newspapers; however, these may not be as effective as other media because there are usually several advertisements placed together and one can be easily overlooked. Another, more recent, advancement in advertising is social media. The versatility and accessibility of the sites through mobile devices and computers makes advertising through social networking websites one of the most effective ways to reach audiences. To develop advertising plans, museums find the media that most effectively reaches their target audiences while considering their budget constraints. By compromising between these two factors, museums develop the most effective advertising campaigns (Adams, 1996).

## 2.7 MUSEUM REVENUE

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Museums are typically not-for-profit organizations and obtain their funding through local authorities, central government, and community support. Depending on the museums' budget or number of staff members, their operating budget can vary and affect the financial status of each organization. Over the years, economic reforms in New Zealand have changed the way museums operate.

The increased growth and expansion in the museum sector has caused a challenge to find on-going support for operational and capital funding. Capital funding for regional museums tend to come from the local authorities and agencies such as the New Zealand Historic Places Trust, the Lottery Grants Board, and the Ministry of Culture and Heritage (Museums Aotearoa,

2005). Other sources of capital funding support come through philanthropic grants, donations and bequests. These agencies provide funding for the creation and conservation of exhibitions and potential funding for expansion and improvement of the museum.

Local governments have a large impact on the success of museums and their exhibitions. The local governments promote the social, economic, environmental, and cultural well-being of communities, which in turn, provide a source of funding to museums through the council authorities. Councils assist museums by providing special grants, subsidized facilities, facility maintenance, tax rate exemptions, or support with administrative work. They tend to promote a long-term support from the community which museums and galleries thrive on (National Services Te Paerangi, 2005). Volunteers, charitable trusts, and community groups are essential in the development of museums through grassroots support. By creating better lines of communication and strengthening the ties between these organizations, museums are able to obtain greater support and funding. In turn, the increase in funding allows museums to become more successful, making them more attractive to other funding sources.

Since the Museum of Wellington City & Sea is part of the Wellington Museums Trust, it obtains significant annual funding through sponsors such as the Wellington City Council, Creative New Zealand, and the Ministry of Education through its Learning Experience Outside The Classroom (LEOTC) services (Wellington Museums Trust, 2012). Due to competition for LEOTC funding, the museum has to ensure that the quality of their educational programming continues to adapt and progress to ensure support continues (Museums Aotearoa, 2005). The Museum of Wellington City & Sea generates more than 35% of the required funding through the support of funders, friends, and trustees (Wellington Museums Trust, 2012). It also obtains funding through its gift shop and guided tours, and through these funds, the museum can finance new activities and special exhibitions to attract consumers (Frey & Meier, 2006).

## FINANCIAL PLANNING IN NEW ZEALAND MUSEUMS

Massey and Lewis (2003) performed a study in New Zealand, in which 115 museums, art exhibitions and other organizations were surveyed “to understand the sources of financial and nonfinancial support they receive, and the types of income-generating activities they undertook” (Massey & Lewis, 2003, p. 325). Based on the findings, it appears that seventy-six

museums were able to meet operating expenses alone, while seventy created and maintained exhibitions through community support. Forty-six of the museums stated that volunteers were also a vital piece for the success and growth of a museum. Twenty-six museums reported that good lines of communication with funding bodies were an important factor in obtaining grants and funding.

In order to respond to the legislative reforms, museums have had to adopt a more “business-like” approach and exercise “good management” practices (Massey & Lewis, 2003, p. 325). Over the years, they have undertaken income-generating activities in order to increase their revenue, which tend to reflect the particular assets of each museum. Of the 180 museums in the study, 108 of them were charged admission or encouraged donations. Other revenue-generating activities included retail shops, which may include sale of local crafts (89 museums), professional services (76 museums), and renting out space (48 museums) (Massey & Lewis, 2003). Massey and Lewis compiled their results showing how museums grouped some of these activities and their relative level of activity, which can be seen below in Table 1.

**Table 1: Grouping respondents by revenue-generating profile**  
(Massey & Lewis, 2003, p. 336).

Activities	Level of activity	Frequency
Charge admission and undertake five or more income-generating activities or do not charge admission and undertake four or more activities	High	28
Charge admission and undertake four income-generating activities or do not charge admission and undertake three or more activities	Medium	14
Charge admission and undertake three income-generating activities or do not charge admission and undertake two or more activities	Low	28
Charge admission and undertake one or two income-generating activities or do not charge admission and undertake one or more activities	Some	75
No activities or only charge admission	None	19
No response		16
<b>Total</b>		<b>180</b>

The table shows the combination of income-generating activities and the level of activity of the museum. The level of activity is a way to group the respondents according to the number of revenue-generating activities they carry out. The level of activity of the museums in the table is

High, Medium, Low, Some, and None. The frequency denotes the number of respondents, out of 180, that have that level of activity (Massey and Lewis, 2003).

Table 1 above reveals museums' tendency to assume one or more income-generating activities in order to increase their revenue. The amount of such grouping depends on the level of activity and size of the museum. We can see that twenty-eight museums with a high level of activity tend to group five or more of these activities, while seventy-five museums with some level of activity tend to group at least one or two. From the 180 respondents, 145 of them grouped two or more of these revenue-generating activities. Based on Massey and Lewis' conclusion of these surveys, "the degree of revenue-generating activity in New Zealand museums is 'common'" (Massey & Lewis, 2003, p.338). Museums group these activities based on the particular assets that each of them may offer, such as location, exhibitions and other leisure activities (Massey & Lewis, 2003). The implementation of several revenue-generating activities in museums has been increasing in recent years, and has helped many museums fund their operating budget. By generating their own revenue, museums have been able to be solvent and increase their funding.

## 2.8 CASE STUDY

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Here we present a case study that highlights our trip to visit a camera obscura exhibition at the Children's Museum and Theater of Maine. While at the museum, we observed the exhibition and participated in the tour offered by the museum and also interviewed staff about the details of the camera obscura exhibition.

### THE CHILDREN'S MUSEUM AND THEATER OF MAINE

To experience a camera obscura first hand, we visited the Children's Museum and Theater of Maine in the north-eastern United States. The museum is located in an historical building in Portland, Maine, and features a camera obscura that was fully donated from the Eastman Kodak Company. The cost was estimated at about a quarter of a million dollars to construct and install. The camera obscura was installed in the cupola that was already attached to the roof of the building. The image produced is reflected into a small room with a round white table in the middle. The camera obscura room is bare, but it is connected to another

room which is called the exhibition room. The exhibition room contained low-technology, easy to use interactive displays along with educational text along the walls.

The museum offers tours by two staff members that are about 30 minutes long and run twice a day, once in the morning and once in the afternoon. The tour is available for separate admission from the rest of the museum, so tours usually contain more adults than children. About every two weeks, an artist or photographer will visit the museum specifically for the unique view provided by the camera obscura. The age of the children attending is usually between ten months and ten years, so parents are sometimes present as well. Throughout the year, around five school groups, ranging in age from primary to university, attend the museum just for the camera obscura exhibition.

We explored the exhibition room for about thirty minutes, and then took part in the camera obscura tour. The exhibition room is open for children in the museum to explore at their own leisure, but the camera obscura room is only available to tour attendees. Unfortunately, we were the only attendees for the tour, so we could not observe how others perceived the exhibition, but we were still able to experience it ourselves. The tour started in the exhibition room first where the tour guide explained how the camera obscura works using a pictured diagram on the wall, as seen below in Figure 6.



**Figure 6: Diagram explained by camera obscura tour guide at Children’s Museum and Theater of Maine.**

We were then brought into the camera obscura room and the lights were turned off. A small hole in the wall was opened and the street and buildings outside were projected upside down on the walls and ceiling, showing how a natural camera obscura works without mirrors and lenses. Next, the roof-mounted camera obscura was turned on and the city became visible on the white table. The guide controlled the mirror and lenses using a set of buttons to give a 360 degree view of Portland that focused on both close and far objects.

The guide adapts what is said to each group based on who is attending. For younger children, she plays I-Spy and counts the number of birds that fly by. However, when adults or older children attend, she talks about the history of the camera and light refraction and provides a more in depth explanation of how it works to add context to the tour. The tour also included simple interactions that are easy for visitors of any age to use. Everyone was given a piece of paper to put in front of the projected image that was used to pick up cars, make ramps on the road, and more. They also incorporated the historical use of the camera obscura to make sketches by bringing over a drawing and placing it over the image being projected. To finish, the tour exited back into the exhibition room. The tour guide informed us that visitors typically spend about twenty minutes after the tour exploring the room.

The curriculum the museum incorporates includes history, science, and simple technology by encouraging “learning through play” and interaction within exhibitions. Museum staff believes this room is underused because it is the only exhibition on the third floor and most people do not know it is there. They also believe that the large amount of writing on the walls is overwhelming and passed over by children if parents are not present to explain what is written, as seen in Figure 7.



**Figure 7: Text-heavy exhibition material on exhibition room walls in the Children’s Museum and Theatre of Maine.**

We asked questions about marketability for the camera obscura to get insight on marketing such a unique exhibition. The museum staff revealed that not many people know about the camera obscura exhibition or that there is separate admission available for it. There is no advertisement on the outside of the museum because it is historical and they cannot add anything to the outside of the museum for marketing purposes. They do have a rack of cards and flyers at the front desk with camera obscura information on it, and it is an option to add the tour to a birthday party or scout tour. There is no merchandise pertaining to the exhibition in the gift shop, so the only source of revenue is through the paid tours.

Finally, museum staff told us that although they do not plan to remove the camera obscura, they do plan to make changes. They would like to add wall shadow experiments and interactive photo-sensitive paint to incorporate more science-related interactive elements to the exhibition and limit the current text-heavy historical exhibition material. They would also like to make a walk-in camera obscura which will allow visitors to be the object being projected. This will make it easier for younger visitors to get a real sense of what is happening in the camera obscura room and how the image is being produce. They also plan to cover the buttons that control the mirrors and lenses and have the camera constantly rotating to show the 360 degree view.

The camera obscura exhibition in the Children’s Museum and Theater of Maine has helped our team understand their educational value and marketability along with the concept of the camera obscura. Although the two possible camera obscura models that the Museum of Wellington City & Sea are designed differently than Maine’s, this experience still benefited our research. Both museum buildings are historical, so they share some operating restrictions, such as not being able to advertise on the outside of the building or add structures to the building. The Children’s Museum and Theater of Maine’s use of paid tours and low-technology interactive aspects can be incorporated into the camera obscura exhibition in Wellington. Overall, the visit was a learning experience for us that ultimately helped us plan an interactive and engaging camera obscura exhibition for the Museum of Wellington City & Sea.

## 2.9 SUMMARY

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In summary, a review of the literature indicated that any museum is enhanced by improved educational value, marketing strategies, and increased revenue. The Museum of Wellington City & Sea can extend educational programming by integrating the New Zealand curriculum objectives into its exhibitions. Because the objectives can be applied to both school children and the general community, they improve the educational experience for all audiences. Additionally, including sensory engagement and interaction in the museum’s exhibitions often promotes learning and the retention of information. Museums can also focus marketing campaigns on the target audience’s interests through the most popular media to implement a successful strategy for reaching visitors. By combining various revenue-generating activities, museums may be able to obtain additional sources of funding and increase their revenue. From the knowledge obtained through the literature and our visitor experience with a camera obscura, we were able to effectively design our research strategies to meet the objectives of our project.



## CHAPTER 3: METHODOLOGY

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The goal of our project was to develop the supportive educational and interactive experiences and marketing plan for a camera obscura exhibition. We accomplished this by meeting the following objectives:

- Design an educational programme and experience for the exhibition.
- Incorporate engaging and interactive features in the exhibition.
- Build and evaluate a camera obscura model.
- Develop a marketing plan for the exhibition.

Chapter three outlines the methods we used to meet these objectives and end goal. To achieve these objectives, we recorded observations and conducted surveys and interviews of museum staff and visitors.

### 3.1 DESIGN AN EDUCATIONAL PROGRAMME AND EXPERIENCE

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Upon arrival to Wellington, we gathered information about the Museum of Wellington City & Sea and other visitor attractions in the area. A personal tour by Paul Thompson, the Experience Manager, brought us through the museum, and to the roof to see the possible view of a roof-mounted camera obscura, which can be seen below in Figure 8.



**Figure 8: View from the roof of the Museum of Wellington City & Sea and possible view for camera obscura.**

In order to develop an understanding of the paid attractions available around Wellington, we visited the Carter Observatory, the OurSpace Deep Ride and High Ride at Te Papa, and participated in the museum portion of the Ship ‘n Chips tour offered at the Museum of Wellington City & Sea. Finally, to evaluate unpaid attractions and sights in the region, we toured local attractions including Big Data at the National Library of New Zealand and the Mana Whenua exhibition at Te Papa.

## **EDUCATIONAL PROGRAMME AND EXPERIENCE**

In order to develop educational programming for the exhibition, we interviewed Rachel Ingram, the Learning and Programmes Manager at the Museum of Wellington City & Sea. Interviewing was chosen because it has the capacity to yield the most in-depth responses, which were vital for our understanding of best practices (Trochim, 2006). This interview

addressed curriculum integration and best practices in education that are currently implemented in the Museum of Wellington City & Sea and at other Wellington museums. We developed questions prior to the interview and took notes which we later reviewed (Mack, 2005). During the interview, we asked relevant follow up questions for clarification and to gain additional information (Mack, 2005). The interview questions and responses can be seen in Appendix A.

We also developed an interview for visitors in Telling Tales, a permanent exhibition in the Museums of Wellington City & Sea that utilizes both interactive and traditional learning strategies. In order to determine which learning methods work best for visitors, we selected an exhibition that offered visual, auditory, and hands-on learning methods. We chose interviewees by asking approximately every fifth visitor leaving the exhibition to take part in the interview. This type of interview can be formatted in a few different ways, but a standardized, open-ended interview was most beneficial for our project. The interview was standardized, asking each visitor the same questions. We also included open-ended questions designed to have more than a “yes” or “no” answer. This type of interview is quick and provided us with data that was easy to compare and analyse (McNamara, n.d.). Visitors were asked to answer questions about the information they retained from the exhibition and what learning methods work best for them in everyday situations in addition to others. The interview questions can be seen in Appendix B.

We analysed the collected data to study the effectiveness of the various learning methods available in Telling Tales to find if they were in line with the preferred learning methods given by visitors. By studying an exhibition in the museum that uses both interactive and traditional learning strategies, we were able to measure the effectiveness of each approach and apply our findings to the camera obscura exhibition.

We conducted archival research on records of teacher evaluations of educational trips from the past two years. These archives contained valuable opinions on the connection between the museum’s educational material and the curriculum. During our research, we pinpointed ‘room for improvement’ and ‘highlights’ and general comments that would be relevant to the camera obscura exhibition; we then categorized these comments.

In order to incorporate Wellington's history into the camera obscura exhibition, we researched Joseph Zachariah. Zachariah was a Wellington photographer at the turn of the century that had a lasting impact on how Wellingtonians remembered current events. Through archival research, we found photographs of different views of Wellington that could be re-photographed in the present and related to the camera obscura exhibition.

## 3.2 INCORPORATE ENGAGING AND INTERACTIVE FEATURES

Our second objective was to develop engaging and interactive features in the camera obscura exhibition. An interactive exhibition involves using more than one of the visitor's senses, while a non-interactive exhibition is classified as only using visual representations. Since the interaction and educational value of an exhibition are related, we combined our interactive interview with our educational interview, discussed in Section 3.1 Design an educational programme and experience. We observed visitors actions and their time spent in the Telling Tales exhibition. This provided us with information about the appeal of the exhibition, what visitors enjoyed, and what they did not enjoy. We conducted "face to face" interviews so questions could be adapted in accordance with the visitor's answers (Purdue, 2012). The time spent in the exhibition and the number of visitors with the interviewee was recorded along with observations of the visitor's behaviour in the exhibition. The interview then commenced and we asked what the most entertaining part of the exhibition was, what from the exhibition they may have learned, and what they had seen, touched, or heard (McNamara, n.d.). Figure 9 shows a group member observing visitor interaction in the Telling Tales exhibition.



**Figure 9: A group member observing visitor interaction in Telling Tales.**

In order to gauge the visitors' sensory experiences, we developed a point system for the interactive elements in Telling Tales which can be found in Table 2 below.

**Table 2: Sensory score point system developed for the interactive interview.**

Sense	Category	Points
Vision	Read	1
	Watch	1
Touch	Buttons	1
	Phones	1
Hearing	Buttons	1
	Movies	1
Others	Workers strike 1913	0.5
	Cinerama room	0.5
	Talking with other visitors	0.5
<b>TOTAL POINTS POSSIBLE:</b>		<b>7.5</b>

There are three senses that can be used in the exhibition, vision, touch, and hearing. We broke each sense down into two categories. For vision, a point was given to a visitor if they read in the exhibition and an additional point if they watched a movie, totalling two possible points for vision. The sense of touch was broken down into pushing buttons that corresponded with stories and picking up the phones to listen to certain movies, giving a total of two possible points for touch. Hearing could also yield two points, one for listening to the noise buttons made and one for listening to the movies. Visitors also received a half of a point for going into the side exhibition room on the 1913 workers' strike, for going into the Cinerama room, and for talking with other visitors about the displays. Interaction between visitors is a half of a point because our literature revealed that social context interaction adds to the visitor experience.

Table 2 shows the point system used to develop visitors' sensory scores. Additionally, a list of each part of the Telling Tales exhibition that incorporates interactivity and its description can be found in Appendix C. These interviews provided insight on what types of sensory interactions visitors prefer along with the correlation between sensory scores, learning, and entertainment in exhibitions.

### 3.3 BUILD AND EVALUATE A CAMERA OBSCURA MODEL

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In order to evaluate how a camera obscura exhibition works and engages visitors, we built a simple model for testing and participant observation. After researching several options, we selected a low-cost, interactive model to develop. Based on our research on camera obscura models, we found four options to consider. Possible designs included a natural camera obscura as shown previously in Figure 2, a portable design as seen previously in Figure 3, a prototype of a table camera obscura as seen previously in Figure 4, and a simple model like the one seen below in Figure 10. Each of these options was a unique design and provided an interactive aspect.



**Figure 10: Low cost, interactive camera obscura model at the Children's Museum and Theater of Maine.**

To choose the final design for our model, we performed a cost-benefit analysis to compare the benefits and performance of the different camera obscura options. We developed six objectives that we considered to be important in determining the best camera obscura model. These objectives were the aesthetics, performance, interactivity, educational value, safety and maintenance of the model. The aesthetics objective considered the materials used as well as how the overall model would appeal to the visitor. The performance objective considered the working operations of the model and how the lens and potential mirrors could provide the best possible image for the user. Interactivity considered all the possible ways that the user could interact with the model, such as changing the focus and point of view of the image. The educational objective considered any potential educational value that could be taken from the model, such as an understanding of focal length and the reason for image inversion. The safety considered the safety of both children and adults while interacting with the model. Finally, the maintenance considered how easily the model could be repaired or modified for the duration of the evaluations.

Using a pairwise comparison chart, we compared each of these six objectives side by side in order to obtain a ranking of the objectives. Through our ranking, we were able to prioritize the design objectives to analyse the different model options. Using Table 3 shown below, we compared each of the objectives in the left-hand column to each objective in the top row. If the objective on the left-hand column was more important than the comparison on the top row, it received a one; if not, it received a zero. By tallying the scores of each objective, we were able to rank them from zero to five, with zero being the lowest rating and five being the

highest. A weighted percentage was then calculated based on these rankings and was applied to evaluate the model options.

**Table 3: Pairwise comparison chart of the benefits selected for choosing a camera obscura model.**

	Aesthetics	Performance	Interactivity	Educational	Safety	Maintenance	Ranking
Aesthetics	-	0	0	0	0	1	1
Performance	1	-	1	1	0	1	4
Interactivity	1	0	-	1	0	1	3
Educational	1	0	0	-	0	1	2
Safety	1	1	1	1	-	1	5
Maintenance	0	0	0	0	0	-	0

Next, each of the models was ranked from zero to ten for each of six design objectives. Using the weighted percentages from the pairwise comparison chart, we were able to develop a weighted score for each of the models to select the best options. The top two scoring models from this analysis were compared based on cost. Through this final comparison, a model was selected and built.

The venue chosen for our model was the Coronation Café. By using the café, we were able to evaluate visitor interaction with the model in a natural, unstructured, and flexible setting. To advertise the model, we developed a brief write-up for the wall about the history of the camera obscura and how to use the model, which can be seen in Appendix D. To evaluate our model, we performed a formative evaluation, which aims “to test ideas for exhibits, and when these do poorly, to modify the design to correct its failing” (Griggs, 1981, p. 189). By doing this form of an evaluation on a model, we obtained information that can be used to make any necessary modifications and produce a recommendation for the finalized exhibition.

The observations provided us with the opportunity to assess visitor interaction, engagement, and understanding of a camera obscura. To evaluate visitor interaction, we assigned each visitor’s interaction with the model to the following categories: *how it works*, *co-interaction*, *focus*, *rotation*, and *write-up*. *How it works* was assigned when visitors looked at how the model produced the image. This could either be by looking at the model and trying to figure out how it worked, or looking at the window and image to observe how the image was produced. *Co-interaction* was assigned when visitors interacted with each other by discussing



about the model. *Focus* and *rotation* were assigned when visitors interacted with the camera obscura model either by focusing the image or rotating the stand. And lastly, *write-up* was assigned when visitors approached and read the write-up that briefly described camera obscuras and explained how to use the model. These categories were used to determine how visitors interacted with the model and what interactive aspects could be implemented in the camera obscura exhibition. The evaluation used for this assessment can be found in Appendix E.

### 3.4 DEVELOP A MARKETING PLAN FOR THE EXHIBITION

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#### MARKETING STRATEGIES

We conducted personal interviews with museum staff to obtain the history and goal of the museum's marketing strategies. For these interviews, our team followed the same interview protocol as the educational interview. We spoke to Kim Young, the Marketing Director, Angela Varelas, the Guided Tour Coordinator, and Chris Hamilton, the Publicity Coordinator. This interview targeted the marketing strategies that the Museum of Wellington City & Sea uses and what they find to be the most successful. The interview guide and minutes can be seen in Appendix F.

We also designed and implemented a survey targeting the museum's visitors that focused on their perception of marketing strategies. We collected data in two dimensions. First, we found the most effective marketing media currently in use by asking, among other questions, how they learned about the museum. Second, we gauged underused marketing media by asking participating visitors to identify what media they interact with most. The marketing survey guide can be found in Appendix G. Surveying was the best tool to obtain this information because they can be distributed in large numbers and completed quickly without interfering with the visitor's museum experience (Trochim, 2006).

#### GENERATING REVENUE

To develop a revenue plan for the camera obscura exhibition, we conducted staff interviews and archival research. We interviewed Nicki Papworth, the Retail Coordinator at the Museum of Wellington City & Sea, targeting the success of exhibition-specific merchandise

offered in the past and the general operation of the retail shop. The interview guide and minutes can be found in Appendix H. We also interviewed Karryn Baudet, the Retail Coordinator of the Cable Car Museum and Carter Observatory. The interview guide and minutes can be found in Appendix I. This interview targeted the decision making process of buying stock and coordinating with the various gift shops within the Wellington Museums Trust. We also received archival records that we used to evaluate merchandise profitability and popularity. Additionally, we researched camera obscura related merchandise to find potential items relating to the exhibition for the retail shop, including books, stationary, and toys.

We evaluated the popularity of revenue-generating guided tours at the museum through past tour records and interviewing managers of a local hostel and the Wellington i-Site. Our interviews with the hostel manager and Selena Murray, the Wellington i-Site manager, both targeted finding what their customers want from a paid guided tour and how the Museum of Wellington City & Sea's tours compare to others offered in the area. Our interview guide and minutes with the hostel manager and Murray can be found in Appendix J and Appendix K, respectively.

### 3.6 PROJECTED TIMELINE

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In order to obtain all of the information for the methodology, we divided the different activities among our seven-week stay in Wellington and provided a tentative schedule to follow, seen in Table 4. The projected timeline helped us keep on track and served as a guideline for our team to complete our goal and objectives.

**Table 4: Our projected methodological timeline while in New Zealand.**

Timeline	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
	01/10 - 01/18	01/21 - 01/25	01/28 - 02/01	02/04 - 02/08	02/11- 02/15	02/18- 02/22	02/25 - 02/28
Archival Research							
Interviews and Surveys							
Build Model							
Observations							
Final Analysis and Conclusion							

## DATA MANAGEMENT

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Data collected through archival research, such as inventory and survey material, were saved at our working stations. These documents were further analysed, not altering the information, and later returned to the museum. The data collected through interviews were compiled digitally and revised after the meeting. The survey information collected was organized in a database. All the survey information remained confidential and no personal information was collected. All of the data collected was secured in password encrypted computers and remained confidential. The information was not given to a third party and was deleted at the end of the project.

## CHAPTER 4: FINDINGS AND ANALYSIS

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In this chapter, we review the findings and analysis for each of our four objectives. The findings were derived from our methodological process, including interviews, surveys, observations, and archival research, and were analysed in conjunction with our literature review. After reviewing each objective individually, we analysed all relevant cross-objective findings to further develop our understanding of the pertinent material gathered.

### 4.1 FINDINGS FOR DESIGNING AN EDUCATIONAL EXPERIENCE

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Through our experiences at the attractions we visited at the beginning of our stay in Wellington, we determined a few trends. We realized that some paid attractions included admission to both the museum and a show that provided educational value, while others used technology that offered little to no educational value. Some of the unpaid attractions in Wellington provided high-technology video and interactive displays that provided educational value. The assessment of the available attractions in the Wellington area helped us gain a better understanding of what the Museum of Wellington City & Sea and other attractions in the area have to offer.

#### EDUCATIONAL PROGRAMMES

To begin an educational plan for the camera obscura exhibition, we reviewed the information obtained from our interview with Rachel Ingram, the Learning and Programmes Manager. Ingram explained that the museum's educational goal for programming is to tell the story of Wellington in an innovative fashion using new learning methods such as drama, music, craft activities, and storytelling. The museum educators see educational visits as a chance for students to learn through new, dynamic methods. These methods enable the museum to offer students programmes that meet LEOTC requirements.

We found that the museum has a range of programmes intended to teach in new ways, from telling the history of Wellington as a capital, to telling tales of Maori myths and legends. In addition to offering several different programme options, every visit can have a focus that is shaped by the teacher and based on what the students are currently learning in the classroom.

By allowing teachers to add a focus, museum educators can personalize every school visit. The museum educators are highly dedicated to creating unique experiences for students from their existing programmes that meet teacher requests. Because of the high level of personalisation for every visit and innovative programmes, the museum receives mostly positive feedback from teachers, and most return annually or biannually depending on their location.

### *Camera obscura programme*

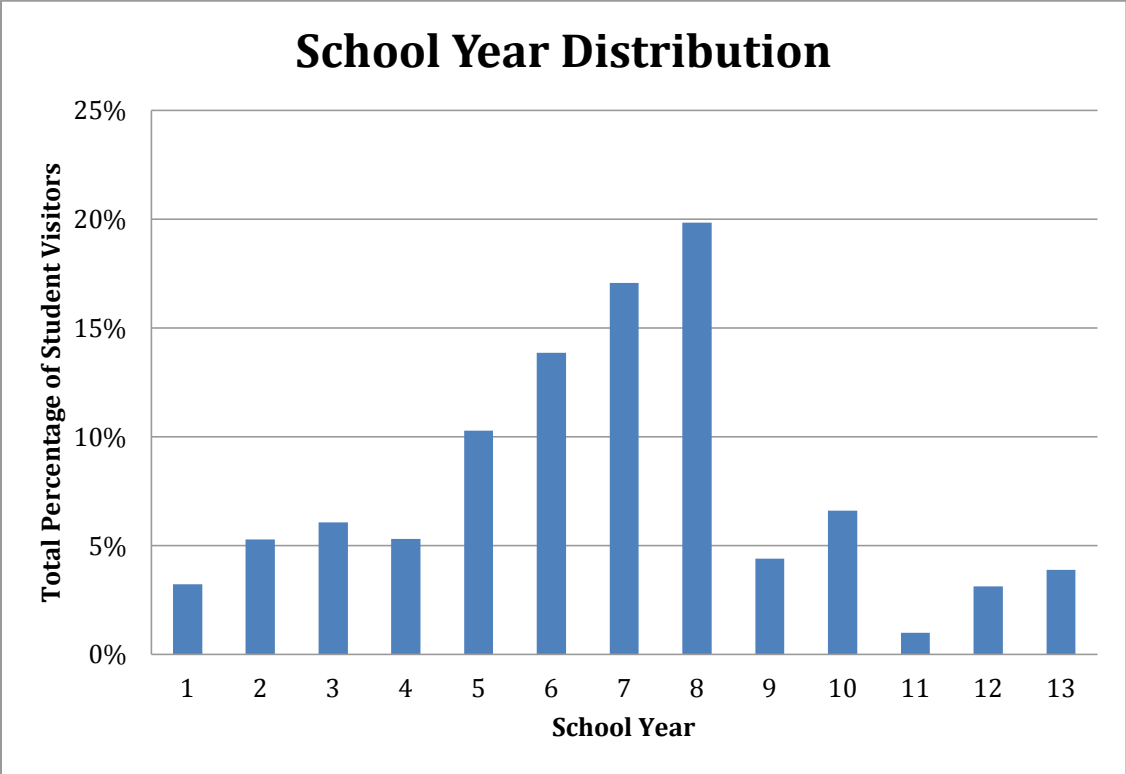
Ingram explained that the camera obscura could generate the *how it works* reaction that the Pepper's Ghost attraction currently causes. Pepper's Ghost sparks the students' curiosity and they immediately want to know how it works. This attraction is a great way to get more students engaged with the programme and museum through technical curiosity. Additionally, it interests the typically less-engaged boys and engages them with the programme by appealing to their curiosity.

We also found that incorporating the Science and Technology curriculums into the camera obscura exhibition would be beneficial for both the museum and students. Ingram suggested that adding science into the museum could create the possibility for a joint programme with Carter Observatory. The combination could offer a more expansive science programme while also including another organization from the Wellington Museums Trust. Ingram suggested placing an age limit for school groups attending the camera obscura educational programme to year-6 and up due to the content of the exhibition. They currently have a similar restriction for the Wahine programme that they offer.

## EDUCATIONAL VISIT DATA

Through archival research, we assessed the data from educational visits. From this research, we found the distribution of student visitors by school year and student groups by region as well as the popularity of the educational programmes. These findings were from two different sets of data. The first set of data was used to determine the distribution of student visitors by school year and school groups by region. This data was from all school visits during the 2012 academic year which included 8,137 students from 213 school visits to any of the Museums Wellington partners. The second set of data was used to review the popularity of the

programmes offered. The available data for this research only covered terms three and four of the 2012 academic year, from 2 July through 21 December. This included 3,899 students from 103 different visiting groups to the Museum of Wellington City & Sea. Students from year-5 through year-8 represented 61% of all student visitors. Of the heavy visitation school years, year-8 was the most common comprising 20% of the total student visitors. Of all the school visits, 70% of the students were in year-6 and up. The distribution of students by school year that visited the museum can be seen in Figure 11.



**Figure 11: The percentage of student visitors by school year from 2012**

From reviewing the distribution of school groups by region, we found that 54% of the school groups were from the Wellington Region, with 55% of those groups coming from within Wellington itself. The highest non-Wellington regions represented were Manawatu-Wanganui, just to the north of Wellington, and Canterbury on the South Island, with seventeen school visits from each of these regions last year. We also found that almost 25% of the groups from

Canterbury came directly from Christchurch. The distribution of school groups by region can be seen in Figure 12.

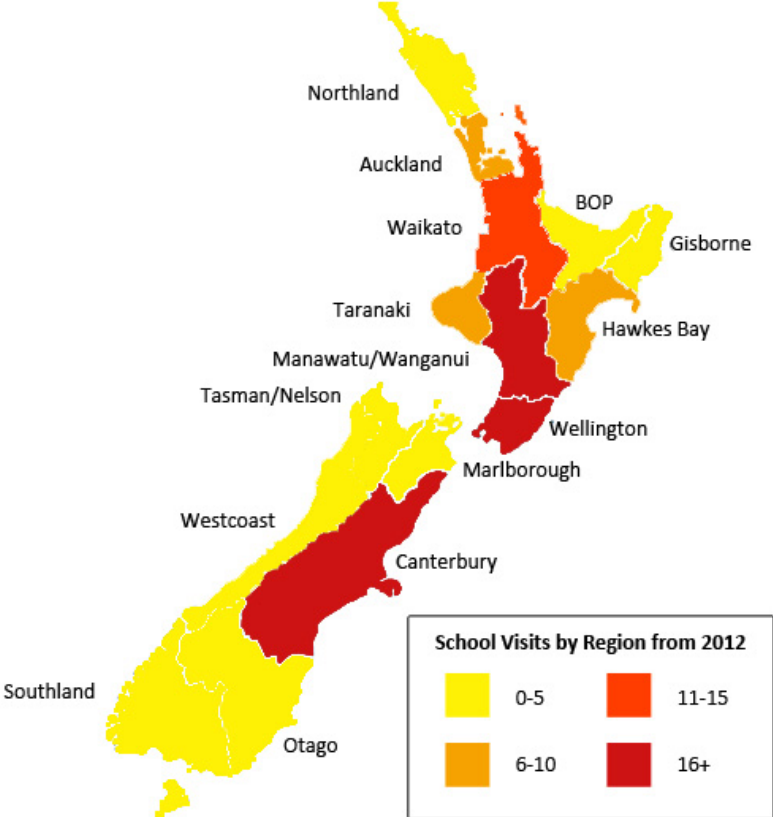
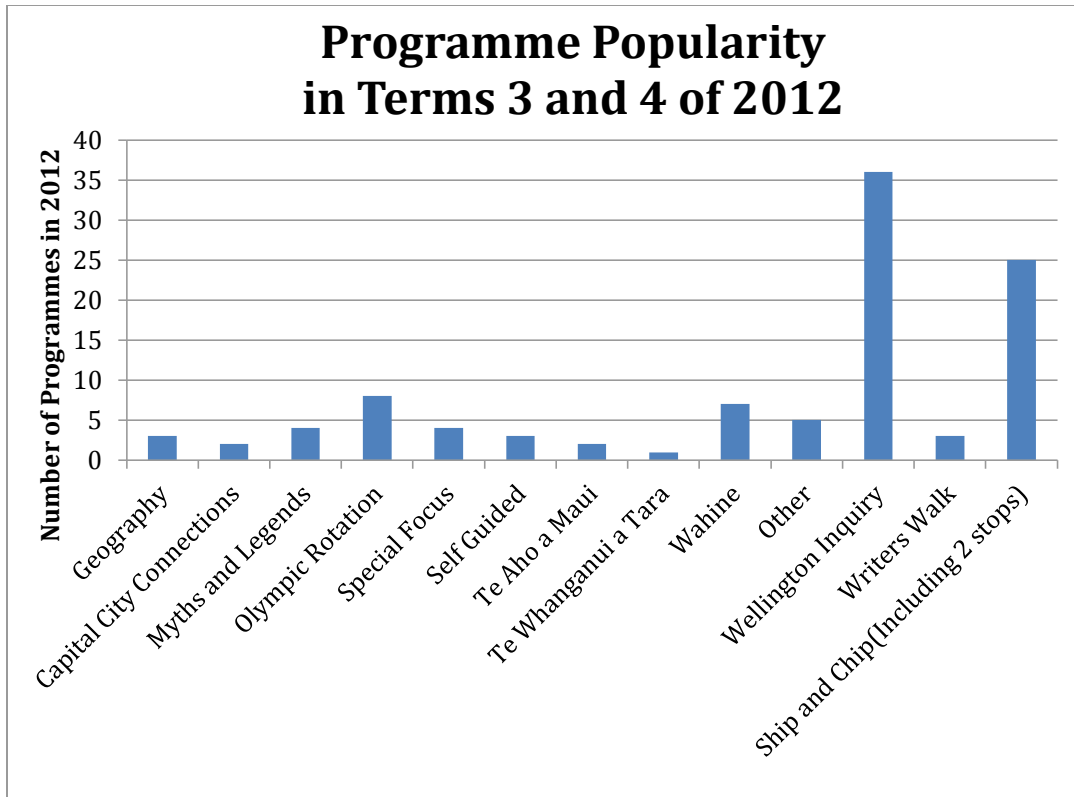


Figure 12: School group distribution by region for Museums Wellington for 2012

The last element from the student visitor data that we reviewed was the popularity of the different educational programmes offered at the Museum of Wellington City & Sea. The breakdown of the popularity can be seen in Figure 13. A majority of the visits came for either the Wellington Inquiry programme (35% of the visits), or some variation of the Ship ‘n Chips programme (24% of the visits). Despite having well-developed programmes with excellent feedback like the Wahine exhibition, the Wellington Inquiry and Ship ‘n Chips programmes dominated the other options, as seen below in Figure 13.



**Figure 13: The popularity of programmes from terms 3 and 4 of 2012 to the Museum of Wellington City & Sea.**

Through archival research of ninety-seven teacher evaluations, we found trends in the comments of the educational programmes offered based on common topics of responses given. In order to find what responses would be useful and relevant for accomplishing our goal, we reviewed all of the questions and identified the open-ended responses including ‘highlights of the visit’, ‘room for improvement’, and ‘overall experience’ as relevant. We found that there were more responses coming from the ‘highlight of the visit’ and the ‘overall experience’ comments rather than the ‘room for improvement’ comments. There were twenty-two relevant highlights and general comments and only four relevant improvement responses. All of the comments that were coded for relevance and analysed can be seen in Appendix L.

Only four ‘room for improvement’ comments were relevant to develop our recommendation because they referred to specific trip logistics, and not programming. Of these comments, 75% were from year-4 and year-5 teachers and were suggestions for increasing the level of interaction and personal exploration time for students as well as developing more



hands-on activities for the exhibitions. One year-4 teacher suggested incorporating “a number of short talks follow[ed] directly by a ‘go and find’ activity to consolidate what was said”.

The remainder of the relevant comments came from the ‘highlights of the visit’ and ‘overall experience comments’ responses. One common topic for the ‘highlight of the visit’ for both students and teachers was Pepper’s Ghost because it stimulates students’ interest and curiosity. One such comment from a year-6 teacher was, “the children really enjoyed the interactive displays as well as trying to figure out how the hologram worked.” Another teacher had a similar comment about Pepper’s Ghost saying the “students loved learning ... after watching the [Pepper’s Ghost] story...about how it is done.” Some teachers commented on the learning and teaching styles that the museum implemented, such as this year-8 teacher that said, “the students had to really look at the photographs and portraits to try and work out what was happening. There was a lot of thinking and a lot of talking in groups about what they were thinking, and what was going on.” Many of the comments were focused on the interaction with the exhibition and artefacts, and some even went as far as to thank the museum for the programme’s interactive qualities, like this teacher who said the ‘highlight of the visit’ was, “the opportunity for our students to have a look and interact with the exhibits - thanks for recognising that they needed this!”

From the education questions answered during the interactive interview, we reviewed visitor learning types. We observed the interaction of fifty-one visitors within the exhibition and reviewed the responses to question six, “What methods do you learn best through?”.

Table 5 shows the distribution of visitors by learning type. Hands-on responses represented 21% of all of the visitors interviewed and all but one self-labelled hands-on learner interacted with the buttons in Telling Tales.

**Table 5: Distribution of visitors by learning type**

Learning Type	Total
Visual Learners	40
Hands-on Learners	7
Both	4
<b>Total Number of Responses</b>	<b>51</b>

## GENERAL EXHIBITION MATERIAL

We expanded upon Paul Thompson's suggestion of incorporating Joseph Zachariah's work into the supplemental material of the camera obscura exhibition. Through our research, we found that Joseph Zachariah, known as Zak, was a prominent Wellington photographer and owner of Zak Studios in the early 1900s. Zak recorded both the festive and sorrowful moments and events of Wellington through the use of photographs. At the start of the 1900s, Wellington's newspapers were unable to print photos due to technical limitations, so Zak Studios took advantage of the new craze by selling postcards showcasing "topical events that happened around the capital" (Main, 2009, p. 6). These photographs became incredibly popular and people soon started collecting them to remember current events of the city.

In addition to the postcard craze, Zak started having his photographs published in newspapers once possible. Between 1909 and 1915, Zak had over 100 photographs published in Wellington's *The Free Lance*. By 1912, Zak's photographic catalogue had grown to over 16,000 images of the Wellington area (Main, 2009). Some of his most famous photographs included the photos of the Parliamentary Fire of 1907. It was profound images like these that captured the real-time happenings of Wellington that set Zak's work apart from other photographers of the era (Main, 2009). Looking back on Zak's photographs, his work serves not only as a record of the current events of the day in Wellington, but also as insight into the daily lives of Victorian Wellington residents. Additionally, visiting students will be able to fulfil the *Continuity & Change* objective of the Social Science learning area as well as the 'thinking' key competency by reviewing Zak's work in this context. In Appendix M you can find several photographs of Zak's that could be re-photographed in present day to show changes in Wellington.

## 4.2 FINDINGS FOR IMPLEMENTING INTERACTIVE FEATURES

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Through the interviews and observations we conducted regarding interactivity in Telling Tales, we calculated the average time spent in the exhibition and measured the level of interactivity each visitor experienced. We recorded the time spent in the exhibition for the fifty-

two visitors that we interviewed, and for an additional fifty-six visitors that we observed. We found that the average time spent in the Telling Tales exhibition was 14.8 minutes.

To measure visitor interaction, we used the sensory score calculated from the point system developed (see Chapter 3: Methodology). Visitors’ scores were compared to their answer to question number five: “Did you learn anything new from this exhibition? If yes, what?”. The highest number of *Specific* answers was given by visitors with the highest sensory score of 6-7.5, while the lowest amount of *Specific* answers was given by visitors with the lowest sensory score of 1-3. The highest number of *Vague* and *Nothing* answers were given by visitors with an intermediate sensory score of 3.5-5.5. For the lowest sensory score, the number of *Nothing* answers was highest and the number of *Specific* answers was lowest, while the highest sensory score had the largest number of *Specific* answers and the least number of *Nothing* answers. A summary of this information can be seen below in Table 6.

**Table 6: Summary of visitors’ sensory scores and their answer to the material learned question.**

	Nothing	Vague	Specific
Sensory score 1-3	4	3	2
Sensory score 3.5-5.5	11	7	5
Sensory score 6-7.5	4	6	7

### 4.3 FINDINGS FROM EVALUATING A CAMERA OBSCURA MODEL

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Through our cost-benefit analysis, we compared each model with the six benefits we described previously: aesthetics, performance, interactivity, education, safety, and maintenance. We weighted each of the benefits then discussed rankings for each benefit and reached a consensus. The models were then ranked from zero to ten; the scores for all of the models and the comparative rankings can be found below in Table 7.

**Table 7: Decision matrix used to compare camera obscura models with weighted benefits ranking.**

	Safety		Performance		Interactivity		Educational		Aesthetic		Maintenance		TOTAL
Weight Factor	28.57%		23.81%		19.05%		14.29%		9.52%		4.76%		100.00%
	Ranking	Weighted	Ranking	Weighted	Ranking	Weighted	Ranking	Weighted	Ranking	Weighted	Ranking	Weighted	
M1	8.00	22.86%	9.00	21.43%	9.00	17.14%	8.00	11.43%	8.00	7.62%	8.00	3.81%	84.29%
M2	9.00	25.71%	10.00	23.81%	7.00	13.33%	8.00	11.43%	9.00	8.57%	8.00	3.81%	86.67%
M3	10.00	28.57%	6.00	14.29%	5.00	9.52%	4.00	5.71%	2.00	1.90%	2.00	0.95%	60.95%
M4	8.00	22.86%	8.00	19.05%	4.00	7.62%	6.00	8.57%	6.00	5.71%	4.00	1.90%	65.71%

The two models that had the highest scores were model one and model two, with total scores of 84.29% and 86.67% respectively. We contacted a contractor to find the cost of building these models which was around NZ\$1300 for each design. Due to cost, we decided to build the model ourselves. We decided to build model one because the complexity of the design and the cost of materials were lower than model two.

The final model was made of wood and measured a total of 12"x12"x15" with an adjustable viewing screen made of a translucent acrylic. The focus could be adjusted by sliding the handles on the side of the box to move the screen. The aperture had a diameter of two inches and a convex lens attached that provided a 2.5x magnification and a focal length of approximately twelve inches. The model was mounted on a stand that was fixed at window height, but was able to rotate left and right to change the view.



**Figure 14: Camera obscura model. Top: Translucent viewing screen of inverted image. Bottom Left: Side view of focus adjustment handles. Bottom Right: View of aperture and lens on front of model.**

A close-up of the camera obscura model can be seen above in Figure 14, while Figure 15 below shows the camera obscura model set-up in the Coronation Café.



**Figure 15: The camera obscura model in the Coronation Café for visitors to interact with.**

For the first couple of days, we found that the model was underused, so we added additional signage and posters to the café. We conversed with visitors and handed out flyers that can be seen in Appendix D, regarding the model to encourage visitors to interact with the model. From the fifty-four visitors observed, we found that the average time spent interacting with the model was 2.2 minutes, and the most appealing interactive aspects were *how it works* and *focus*. The number of visitors that were applied to each category of interaction is recorded in Table 8.

**Table 8: Number of visitor interactions for each category.**

Category of Interaction	Number of visitor interactions
How it works	45
Co-interaction	41
Focus	45
Rotation	26
Write-up	28

We also found that the model appealed to visitors that were less than fifty years old because they were more likely to interact with the model. The evaluation also revealed that

visitors whose interaction was applied to the *co-interaction* category interacted with the model longer because they discussed the model. Through these observations and the literature reviewed, we found that visitors feel more comfortable with interaction and exhibition material if they are provided with initial context surrounding the topic. Although we were only observing, some visitors gave unsolicited comments about the model such as a comment saying that the model was, “simple... just like old cameras used to be like”.

## 4.4 FINDINGS FOR DEVELOPING A MARKETING PLAN

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### CURRENT MARKETING STRATEGIES

Our interviews with Kim Young, Chris Hamilton and Angela Varelas, who are responsible for marketing the museum, revealed that the museum can only allocate a modest amount of funding for marketing. Young described a few techniques the staff uses to market and promote the museum on such a budget. One technique is to take advantage of current events, usually taking place within Wellington, to promote the museum. For example, they developed a temporary exhibition that displayed replica crown jewels when Prince Charles and Lady Camilla came to Wellington in November. The museum also held an unofficial birthday party for the royal celebrities, which was featured on Breakfast TV twice in one week. Additionally, the museum uses anniversaries of important events in Wellington’s history as a tool to promote specific exhibitions such as the Wahine Disaster. Finally, they host speakers, book signings, and well-known figures to draw visitors to the museum.

Through our interview with the marketing team along with observing staff and visitor interaction, we found that the museum stresses treating visitors in a friendly and informal manner. For example, they explained that the receptionists greet everyone that walks into the museum to create a comfortable and inviting atmosphere. They believe that this environment is one major reason visitors recommend the museum to others or return for future visits.

### *Current advertising methods*

In our interview with the marketing team, we found that modest marketing funding has placed restrictions on the advertising and promotion capabilities of the museum. Currently, the marketing team focuses on promoting the museum through printed media, signage, brochures

at information centres, and multiple online tools. We also found that using printed media, such as newspapers, is one of the most expensive forms of advertising the museum uses. Although the staff attempts to use free advertising space as often as possible, they do purchase it in local newspapers at times. When they do purchase advertising space, the staff tries to take advantage of deals such as obtaining a free editorial with each purchase. The museum also provides photos for local stories for free, but adds their name and logo below, creating a makeshift full page advertisement.

We found that the museum also utilizes various types of signage to promote the museum, but are limited in what they can place on the building because of its historical designation. Examples of the museum's current exterior signage can be seen in Figure 16, 17, and 18.



**Figure 16: Exterior signage at the museum promoting the Coronation Café**





Figure 17: Shipping containers that the museum uses as exterior signage to relate the museum to the Bond Store and the shipping industry.

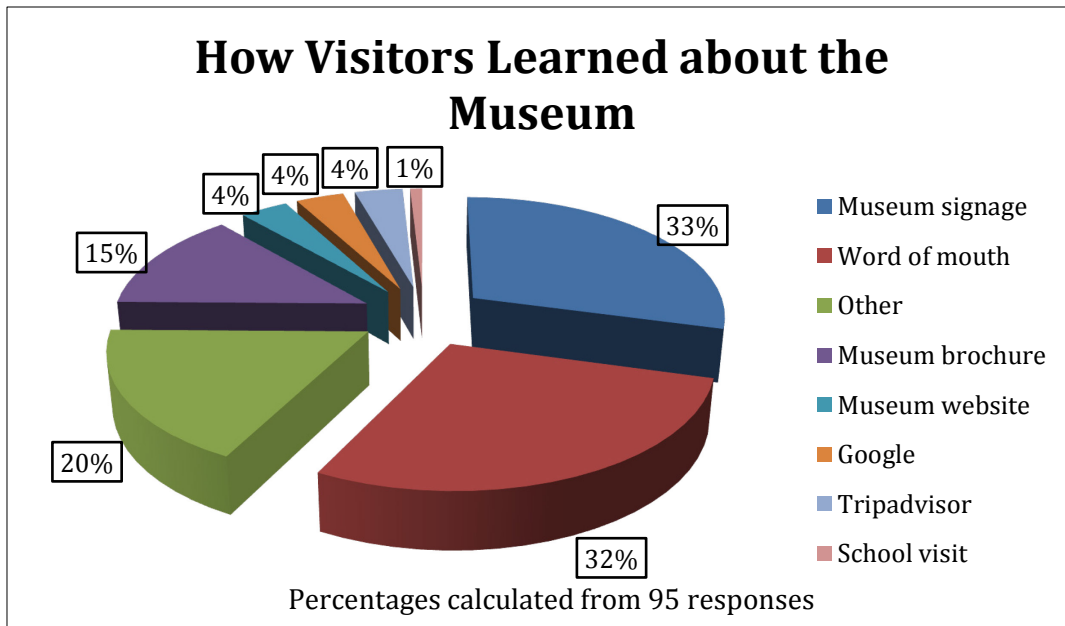


Figure 18: Exterior signage at the museum promoting the retail shop.

The museum also hangs branded posters in libraries and attractions throughout Wellington, such as the Wellington Cable Car boarding areas. The museum similarly distributes brochures to tourist information centres around New Zealand such as i-Sites, hotel reception desks, and recreation centres. They receive more requests for a restock of brochures from the Wellington ferry information centre than any other local destination.

Finally, we found that the museum utilizes several online tools to promote the museum and specific exhibitions and events. The museum occasionally sends e-alerts, e-cards, and e-newsletters to their mailing list to inform recipients about upcoming events, new exhibitions, and general museum news. They also have an account with a trip advising website called Event Finder. This website is associated with several other similar websites such as TripAdvisor, so when events and programmes are posted, they are distributed to other affiliated sites. However, the staff can only post events on the site through their account, meaning they have to create an endless event on the site to promote the exhibitions. They also promote the museum using Facebook and use the page in a similar way they use Event Finder and the e-newsletters. Therefore, they are able to spread awareness about the museum through their growing online following.

Through our marketing survey, we found that of the ninety-five responses, 33% of participants had learned about the museum through museum signage, whereas 32% heard about the museum through word of mouth. The results are shown in Figure 19 below.



**Figure 19: Responses to “How did you hear about the museum?” question from marketing survey.**

We also found that 15% of participants learned about the museum from the museum brochure obtained at several locations such as the Wellington i-Site, cruise ships, and hotel travel desks. We also found trends relating to where participants lived. There were zero New Zealand nationals and thirteen foreign participants that heard about the museum from the brochure.

The participants were also prompted to rate their interactions with media on a scale from 1 being *Never* to 6 being *Multiple times a day*. The entire scale and prompt can be found in question thirteen of the marketing survey in Appendix G. We averaged the ratings for each visitor and formed a graph to show the comparison between the media, seen below in Figure 20. We found that participants interact with television, radio, Google, and newspapers most often with average ratings of 4.9, 4.6, 4.4, and 3.7 respectively.

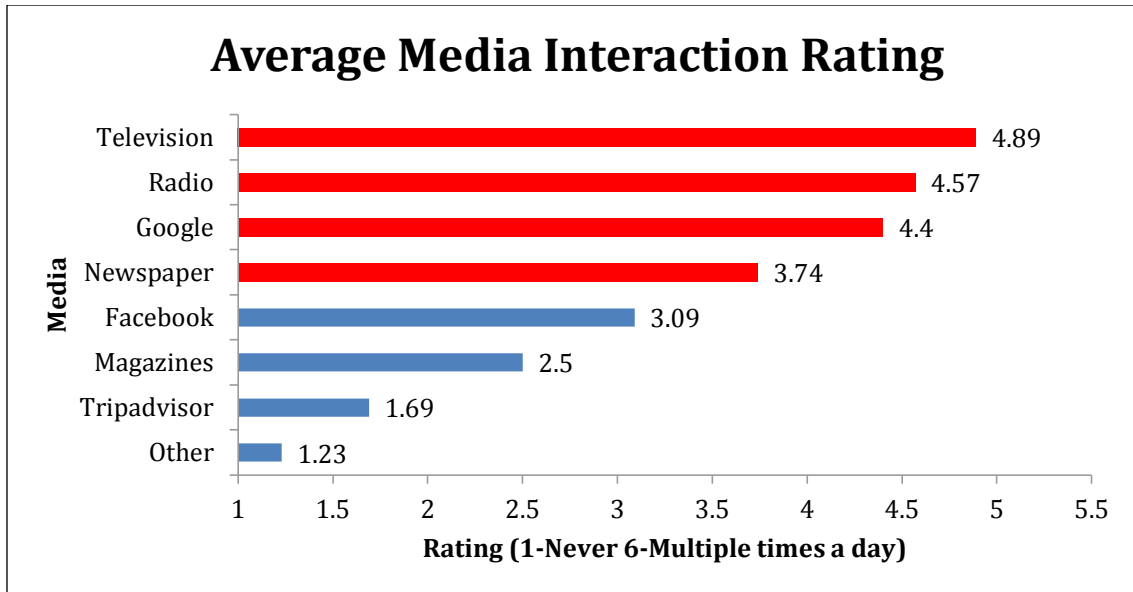


Figure 20: Average visitor rating for media interaction from marketing survey.

Additionally, the visitors were asked to gauge their reliance on various media as a source of information for activities to participate in. This reliance referred to what participants use in general, rather than relating to the museum directly. Participants were asked to rate their reliance on a scale from 1 being *Not at all* to 5 being *Very strongly*. The entire scale and prompt can be found in question fourteen of the marketing survey in Appendix G. The ratings for the different media were averaged and can be seen in Figure 21 below.

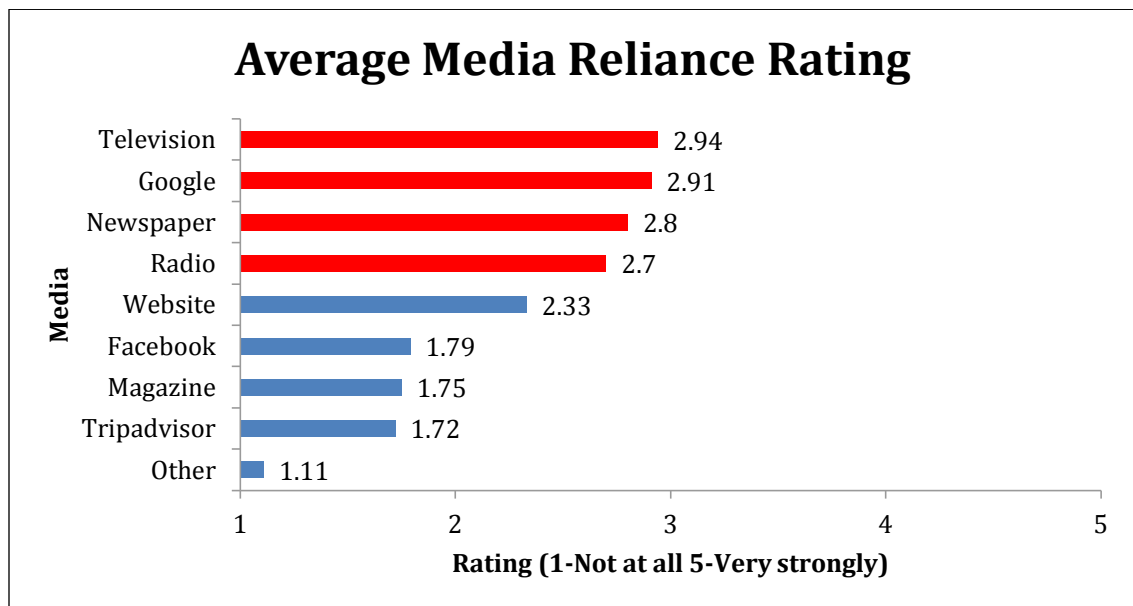


Figure 21: Average visitor rating for media reliance from marketing survey.

Through these responses, we found that participants rely on television, Google, newspapers, and radio most often as a source of information, with average ratings of 2.9, 2.9, 2.8, and 2.7 respectively. We found through our research that the most popular newspapers in the Wellington and Christchurch regions are the Dominion Post, with a weekly coverage of about 428,000 readers, and The Press, with a weekly coverage of 390,000 readers (Dominion Post, 2013).

Another trend our team found was that the younger the participant, the more they interacted with and relied on online media such as Facebook and Google. Participants in the age range of 20-29 gave the highest average interaction and reliance rating for both Google and Facebook. Similarly, participants in the age range of 30-39 gave the highest average interaction ratings to Google and Facebook, but their reliance ratings were highest for newspapers, Google, Facebook, and other websites. For participants in the 60+ age range, Google received a below average interaction and reliance rating compared to television, newspapers, and radio. In addition, the 60+ age range ranked television as the highest media for both interaction and reliance. Finally, we determined a trend that participants over 40 did not rate Facebook in the top four media for interaction or reliance.

## CURRENT REVENUE-GENERATING STRATEGIES

### *Retail*

Through the interviews our group conducted with Nicki Papworth, the Retail Coordinator for the Museum of Wellington City & Sea, and Karryn Baudet, the Visitor Services Manager of Carter Observatory and the Cable Car Museum, we obtained information regarding the general practices and patterns of a few retail shops in the Wellington Museums Trust. The retail shop at the Museum of Wellington City & Sea can be seen below in Figure 22.



Figure 22: The retail shop located on the bottom floor of the Museum of Wellington City & Sea.

Baudet and Papworth revealed that sales, mostly of New Zealand branded souvenirs, increase significantly when cruise ship passengers and other tourists arrive in Wellington during the summer months. We also found similar information from the museum retail records. In the 2011 to 2012 cruise season, the average spent per day in the retail shop increased by NZ\$615.96 when a cruise ship was in the harbour, partially due to increased sale of tours. We also learned that the items in the retail shop at the museum are generally priced to target a 52% revenue margin.

We learned that stationary such as notebooks and pens are usually successful exhibition-specific items along with coffee table books. The museum has offered exhibition-specific merchandise in the past and the sales were strong. The most recent item was a picture book titled Black in Fashion, seen in Figure 23, which had short descriptions for a recent temporary fashion themed exhibition.



**Figure 23: Black in Fashion, an in-house developed book for a temporary exhibition.**

Both Papworth and Baudet mentioned that the Black in Fashion book was successful because it was appealing to the eye, easy to read, and captured the visitors' interests. They compared this success to the failure of another exhibition-specific book developed by City Gallery titled Oceania: Exploring the Pacific, which can be seen below in Figure 24. It was revealed that the Oceania: Exploring the Pacific was unsuccessful because it had an unappealing cover photo and was text-heavy with unimpressive photographs.



**Figure 24: City Gallery's book [Oceania: Exploring the Pacific](#).**

We assessed the Museum of Wellington City & Sea's retail shop records to find the popularity and profitability of all the items currently being sold. We found that New Zealand branded souvenirs, like the merchandise seen in Figure 25, have the highest quantity sold compared to all other items in the retail shop.





**Figure 25: Example of New Zealand branded merchandise that the retail shop offers.**

The shop sold an average of 320 New Zealand souvenirs for the first financial quarter, the months of July through September, for years 2010, 2011, and 2012. The quantity sold increased to an average of 577 items for all three years in the second financial quarter, the months of October through December. In comparison, stationary and calendar items had the second highest quantity sold for all three years with averages of 215 and 444 items sold for the first and second financial quarters respectively. New Zealand branded souvenirs are not the most expensive merchandise offered; however, they are one of the most profitable due to the large volume sold. In the past three years these items have generated an average of NZ\$467.56 in revenue for the first financial quarter with a profit margin of 48% and NZ\$875.65 for the second quarter with a 52% profit margin.

We also found that stationary items, books, and toys are profitable for the museum. Figure 26 below shows an example of New Zealand branded stationary that is popular in the retail shop.



**Figure 26: An example of New Zealand branded stationary that the retail shop offers.**

Of the three, books have generated the greatest amount of revenue with NZ\$322.55 with a 28% profit margin in the first quarter and NZ\$821.5 with a 47% profit margin in the second quarter of 2010, 2011, and 2012. Both stationary items and toys have generated only a slightly smaller amount of revenue than books for the museum, revealing that they are also successful items in the shop. Through our research of camera obscura related merchandise, we found a few options for toys and coffee table books. A simple toy with low cost materials is a pinhole camera kit. Most of the examples we found only required a small amount of assembly after purchase. From Amazon.com we found the price range for these items to be about NZ\$15.00 to NZ\$50.

### *Guided tours*

We found that the museum has offered tours for specific exhibitions in the past, which have generally seen little success as well. One tour offered a guided walk through a rugby photography exhibition. This tour gave visitors the opportunity to talk with the photographer, Peter Bush, a famous New Zealand photojournalist and sport photographer, about the exhibition and his photography. Despite the popularity of Peter Bush, visitor attendance for this tour was much lower than the staff had anticipated.

The staff expands their tours by coordinating with the other organizations within the Wellington Museum's Trust and other companies on the harbour such as ferry services. They said, however, that transporting visitors is difficult because they lack a museum-owned vehicle for this purpose. They currently overcome this difficulty by including unique transportation such as a ferry or Wellington Cable Car ride as a way to get to the next part of their tour. Tour participants receive priority at the cable car queue which is useful during high traffic days when cruise ships arrive. The tours are required to follow a strict timeline and operate at certain times every day to coordinate with the transportation schedules.

The museum targets cruise ship passengers and other tourists for guided tours during the summer season, or peak season, because of the vast number that visit Wellington. The staff tries to appeal to tourists by offering the opportunity to ride the Wellington Cable Car or visit Matiu/Somes Island, two popular tourist attractions in Wellington, as part of their tours. The museum had 3,753 total tour participants for the 2011 to 2012 season and a 26% increase in participants from the year before. Of the year's total tour participants, 1,484 were during the cruise ship season. The gross tours' revenue from the 2011 to 2012 cruise ship season was NZ\$17,637.50. As a reference, the museum's annual revenue from tours is NZ\$37,550.22.

Through our interviews with Selena Murray, the Wellington i-Site Manager, and the hostel manager, we gained objective information regarding paid tours in Wellington. During the off peak season, from April to September, the hostel hosts several school groups. The groups most often take free walking tours around Wellington at Te Papa, Parliament, and the Museum of Wellington City & Sea. We found that visiting cruise ship passengers most often choose package deals that include multiple sites like the Lord of the Rings tour. Packages that include

transportation to certain sites or just around the city, such as the John's Hop On Hop Off tour, are ultimately more successful than those that do not.

Murray revealed that tours and activities that take a few hours are more popular than those that are shorter. Most visitors already know about the Wellington Cable Car when coming to visit, either from the cruise travel advisors or other travel sources, and inquire about the ride prices at both the i-Site and the hostel. The older visitors often buy the city tours and museum tours for transportation purposes, whereas the younger visitors would rather save money by walking around the city and taking free tours. We found that the hostel manager did not know about the tours that the museum offers so it is hard to sell them to costumers. She said that people in her position can sell tours better when they have experienced it for themselves.

Additionally, Murray revealed that it is difficult to sell paid tours that include several free or cheap attractions such as the Right Royal Tour. This tour is NZ\$25 and it includes a Wellington Cable Car return trip, a six dollar value, and a tour of a free admission museum, which makes this type of tour difficult to sell. Ship 'n Chips, on the other hand, is a popular tour sold at the hostel, but not as popular at the i-Site. Tourists are more likely to buy tours with special offers or discounts, than paying full price without any other incentives. The hostel manager said that brochures are usually an effective way to inform potential visitors of what the museum offers. We also found that A4 sized posters that include more pictures and deals than text heavy promotional flyers are more appealing to tourists and other potential visitors.

## LIMITATIONS OF OUR FINDINGS

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Since we found the average museum visitor to be above the age of fifty through our interactive and educational interview, marketing survey, and model evaluation, and this did not match the museum's annual demographics, we believe there is possible error with our collected data. Our findings from these methods may be skewed due to small sample sizes and because we conducted research during peak season, which resulted in an over representation of cruise ship visitors.

## 4.5 ANALYSIS

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In this section, we discuss our analysis of the information that we collected. We first analyse the educational experience in a museum setting by categorizing the teacher comments reviewed to find trends. Then we move into the interactive aspects of an exhibition by analysing the interview data regarding sensory score, material learned, entertainment, and time spent in an exhibition to find relationships. We also analyse visitor's interaction with a camera obscura model to obtain a better understanding of visitor engagement and appeal to this type of exhibition. Finally, we analyse data from the marketing surveys and tour interviews conducted regarding the marketing plan.

### EDUCATIONAL EXPERIENCE

To begin our analysis of the teachers' comments, we assigned them to one or more of the following categories: *level of interaction*, *hands-on*, *teaching styles*, *how it works*, and *craft projects*. These categories reflected the key topics that we found in the teacher comments. The *teaching styles* category was assigned to comments that referred to the new ways of learning in the programmes such as drama, music, activities and story-telling. The comments were assigned to the *hands-on* and *craft projects* categories only if they directly contained those terms. Comments that talked about engagement and general interaction between students and the museum exhibitions or educators were assigned to the *level of interaction* category. Comments about high levels of student curiosity in finding out how the Pepper's Ghost attraction worked were assigned to the *how it works* category. The number of relevant comments assigned to each category can be seen below in Table 9.

**Table 9: Number of relevant comments labelled as each category.**

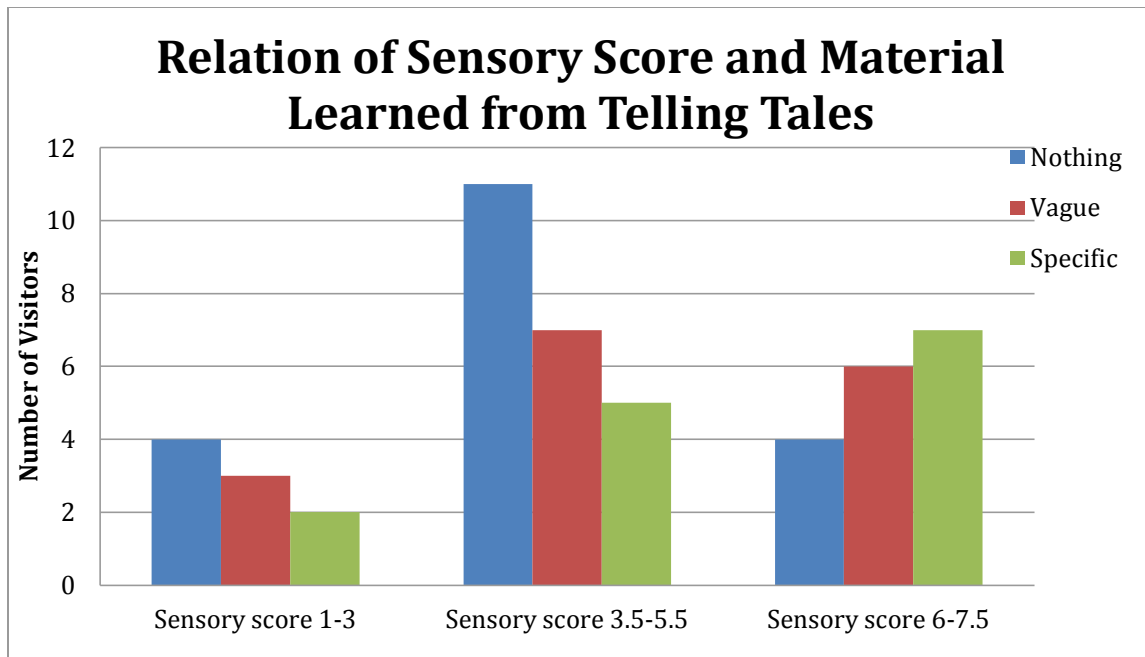
Category	Number of comments
Craft Projects	2
How it Works	3
Hands-on	10
Level of Interaction	8
Teaching Styles	4

*Hands-on* and *level of interaction* were found to be relevant most often, and all but four of the comments were assigned to one of these two categories. Because these categories were so closely related and most common, it became clear the teachers highly value the interactive experience the museum provides. Since comments were frequently assigned to multiple categories, it was apparent that the programmes utilized and highlighted several topics.

Through our educational data analysis, we found that year-5 through year-8 are the most common age groups that visit the museum, and a year-6 through year-8 target audience for the educational programme would be most beneficial for the camera obscura exhibition. Therefore, the improvement comments given by year-4 and year-5 teachers do not directly relate to the exhibition, but were still considered for year-6 students that are working at a lower curriculum level than their peers.

## INTERACTIVE EXPERIENCE

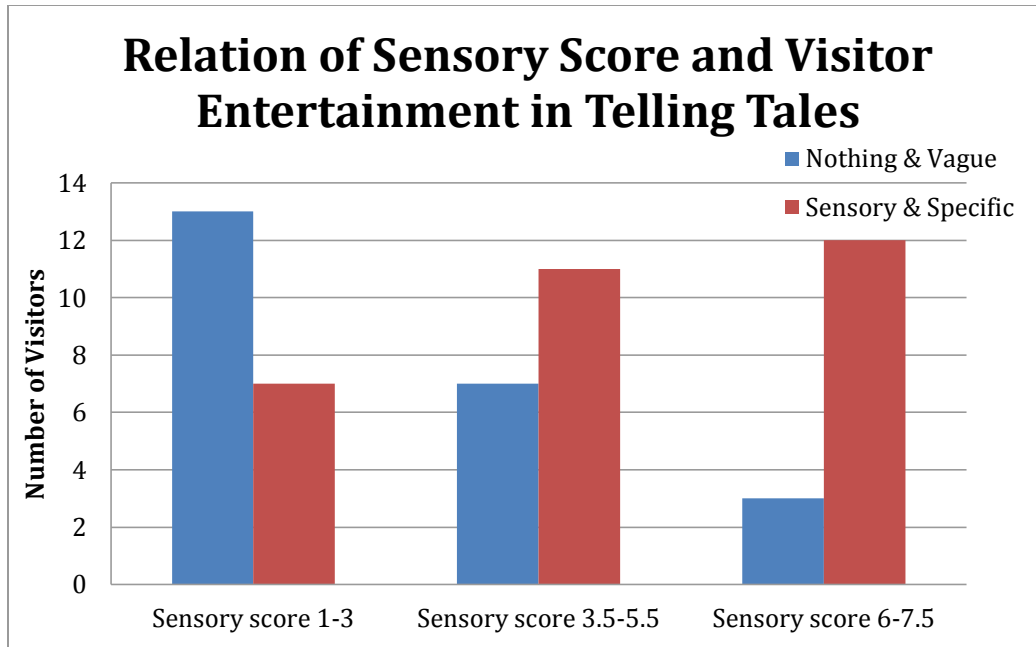
Through the literature, we found that students, as well as general visitors, have a higher rate of retention of material-learned through interactive and engaging exhibitions (Dean, 1996). Our interactive interview data supported this and revealed that the more engaged the visitor was through interaction in the exhibition, the better they retained the information. The data from question five of the interview regarding material-learned in Telling Tales was broken down into three categories: *Nothing*, *Vague*, and *Specific*. If a visitor answered the question by saying they learned nothing, they were put in the *Nothing* category. If the participant answered with a vague answer, such as 'everything' or 'Wellington's history', they were placed in the category *Vague*. Finally, if the visitor had a specific answer about what they learned, such as 'when the windmill was erected' or 'about the elephant at the zoo', they were placed in the *Specific* category. We then compared the sensory score and material-learned for each interviewed visitor using a bar graph, seen below in Figure 27.



**Figure 27: The relationship of visitors’ sensory scores and the material they learned in the Telling Tales exhibition**

We considered the answers as retention of information, rather than how much visitors learned, because *Vague* answers were given most with an intermediate sensory score. This revealed that people learned something after interacting, but they could not retain the information long enough to give a *Specific* answer. The visitors with the lowest sensory scores had the least amount of *Vague* and *Specific* answers. This revealed that the less interaction they experienced, the less material they learned and retained. We determined that increasing the level of interaction and engagement in exhibitions increases the retention of information for all visitors and also engages hands-on learners.

To compare the sensory scores to the entertainment question responses, the entertainment answers were broken up into four groups: *Nothing*, *Vague*, *Sensory*, and *Specific*. The categories *Nothing*, *Vague*, and *Specific* were classified the same as the material-learned answers, but the category *Sensory* was added for answers such as “pushing the buttons” or “listening to the movies”. Once classified, the *Nothing* and *Vague* answers and *Specific* and *Sensory* answers were grouped together because of their similarities. These two groups of data were compared to the visitor’s sensory scores using a bar graph, seen below in Figure 28.



**Figure 28: Visitors’ sensory scores related to their entertainment level in the Telling Tales Exhibition.**

Since visitors with the lowest sensory score most commonly answered in the *Nothing & Vague* category and visitors with the highest sensory score most commonly answered in the *Sensory & Specific* category, it appears that interacting with exhibitions forms an entertaining and enjoyable visitor experience. Therefore, we found that both material-learned and entertainment in the exhibition were increased as the visitor’s sensory experiences increased.

One Telling Tales visitor over fifty years old answered, “touching and that sort of thing is for children” when they were asked about their sensory experiences within the exhibition. This quote supported the trend that visitors over the age of fifty are less likely to interact with the Telling Tales exhibition, which was in line with our findings from the model evaluations. From this, we discovered a trend that older visitors are still in the mind-set that museums are “Please Don’t Touch” institutions. Through our difficulties attracting visitors to the model, we determined that most visitors require initial context to preface their experience and interaction with an exhibition.

From our model evaluations, we found that *focus* and *how it works* interactions were more common than *write-up* interactions. This revealed that visitors focused more on the interaction available than the information provided. The teacher comments and model



evaluations were connected through the frequency of their *how it works* category. This revealed a trend that student groups and general visitors have a curiosity for figuring out how things work. In addition, we found that our teacher comment categories, *how it works*, *level of interaction*, *hands-on*, *craft projects* and *teaching styles*, all related to increasing entertainment through sensory experiences. Because the teacher comments were a reflection of both the teachers' and their students' highlights, we determined that sensory experiences are entertaining for both the general museum visitors and the targeted educational age group.

## MARKETING PLAN

For marketing purposes, hosting well-known speakers or guests and creating temporary exhibitions help the museum become part of the community and expand its identity by capitalizing on visitors' current interests. Through our interview with the marketing team, we discovered that the museum uses advertising media that are low-cost, long-term, and easily shared, especially shown through the use of Event Finder, e-newsletters, and Facebook. Additionally, we found a trend from the portion of the marketing survey that targeted visitor reliance on and interaction with various media. The top four media used by visitors for both of these categories were television, radio, Google, and newspapers. These media were ranked highest for visitors; however, the survey also revealed that visitors found out about the museum most often through museum signage, word of mouth and brochures. This reveals that television, radio, Google, and newspapers could be more effective media to reach potential visitors.

For the retail shop, we analysed coffee table books by considering the failure of Oceania: Exploring the Pacific and the success of the book Black in Fashion. One reason Oceania: Exploring the Pacific was unsuccessful was its extensive text and descriptions. Black in Fashion featured shorter descriptions and less text, which suggests that a limited amount of text in an exhibition-specific book is often preferred by visitors. Another difference between the two books was the appeal of the images featured in the books. Oceania: Exploring the Pacific had images of specific displays in the exhibition with little supporting material, whereas Black in Fashion had general fashion images that could be interpreted without the exhibition.

These discrepancies suggest that visitors would prefer a picture book to have more general images that all viewers can enjoy, not just those who have experienced the exhibition.

Additionally, the scenic qualities of the camera obscura exhibition could provide opportunities for exhibition-specific New Zealand branded merchandise. Panoramic images of New Zealand's landscapes could be related to the camera obscura exhibition for retail use. The popularity of New Zealand branded souvenirs suggests that branded exhibition-specific merchandise could have similar profitability.

Stationary items appeal to all types of visitors due to its general functionality and souvenir potential. Additionally, stationary can be customized without interfering with their usability, which opens opportunities for creating camera obscura related items. Similar to book sales, Papworth mentioned that the more interesting and appealing stationary items are more popular than the blander ones. Therefore, we found that placing camera obscura related images on stationary items would be more successful than just branding the item for the camera obscura exhibition.

Offering toys related to the camera obscura would be another retail option that could prove profitable for the museum. The pinhole camera kits we found through our research have the option for low pricing at about NZ\$15, which may be appealing for parents buying their children toys. The kits only require a small amount of assembly, making them great options for children.

Through our interview with the hostel manager, we found that the Ship 'n Chips tour is popular because it has multiple stops and transportation is provided. There are a few reasons to include multiple attractions to increase the popularity and success of tours. One such reason is that tourists and cruise ship passengers are the most common tour attendees and want to see as much of Wellington as possible in a short amount of time. An additional reason is that including paid attractions in the tour appeals to more customers as they only have to pay one fee for multiple attractions. The third reason is that including multiple attractions can increase the tour's duration, which aligns with visitor preference for tours that last two to three hours. Multiple stop tours are appealing to not only cruise ship passengers and tourists, but also to student groups due to their similar needs and limitations for tours.

We also found that tours felt pressed for time and that participants were rushed to the next location with very little time to spend in the retail shop. Since the time in the retail shop is limited and the museum is not often the final destination of the tour, the museum is less likely to generate additional revenue from tour participants. If tours were to end at the museum, participants would have time to go through the retail shop which could possibly increase sales.

## SUMMARY

In sum, the analysis seems to point to several trends; first, that interaction is important for all visitors to provide a more worthwhile and enjoyable experience. Next, visitors to a social history museum may need an initial context to bridge the gap to a science-related exhibition. Additionally, a generational gap in media usage exists due to the changes in technology reliance. Installing a new exhibition requires understanding and merging these trends to tailor to the specific needs of the museum and its visitors.

## CHAPTER 5: RECOMMENDATIONS AND CONCLUSION

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### 5.1 RECOMMENDATIONS

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By incorporating the information we have obtained through research and our analysis of the interviews and surveys, we have developed a set of recommendations for the camera obscura exhibition. The suggestions derived from the interactive and educational analyses are presented in the order that a visitor would walk through the proposed camera obscura exhibition. Our recommended marketing plan includes marketing strategies and revenue generating suggestions.

#### EDUCATIONAL AND INTERACTIVE EXPERIENCES IN THE EXHIBITION

As part of the museum's redevelopment plan, the camera obscura exhibition will be located on the top floor which will be remodelled to have a layout similar to the other three exhibition floors. The space allotted to the camera obscura is similar in size to the Wahine film and Pepper's Ghost attraction located on the lower floors. The floor is divided into two sections by the staircase, located in the middle. The museum is planning to implement an activities space with a long table for interactive projects on the top floor directly in front of the staircase. The remaining space will be used for the camera obscura exhibition. The layout of the allotted space for the camera obscura exhibition can be seen below in Figure 29, and the layout of the entire third floor can be seen in Appendix N.

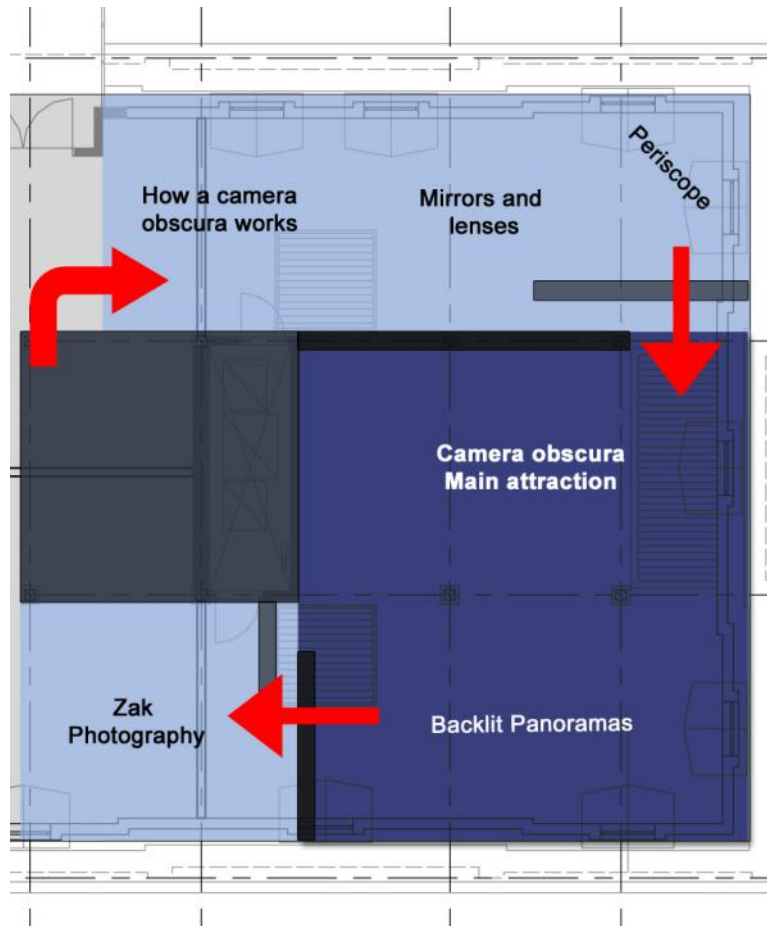


Figure 29: Proposed camera obscura exhibition layout.

For the camera obscura exhibition, we suggest that the supplemental material flank both sides of the staircase. We developed an over-arching theme of *Capturing Wellington's Changes* to embody the essence of the exhibition. By highlighting how Wellington has changed over the last 150 years through photographs and stories as well as offering a new perspective of modern Wellington, the exhibition will show visitors the short and long term changes to the city. Additionally, to connect the camera obscura to Wellington's history, we suggest highlighting the return of a camera obscura attraction to Wellington. Below, Figure 30 reveals a flyer of a camera obscura exhibition that came to Wellington in 1880.

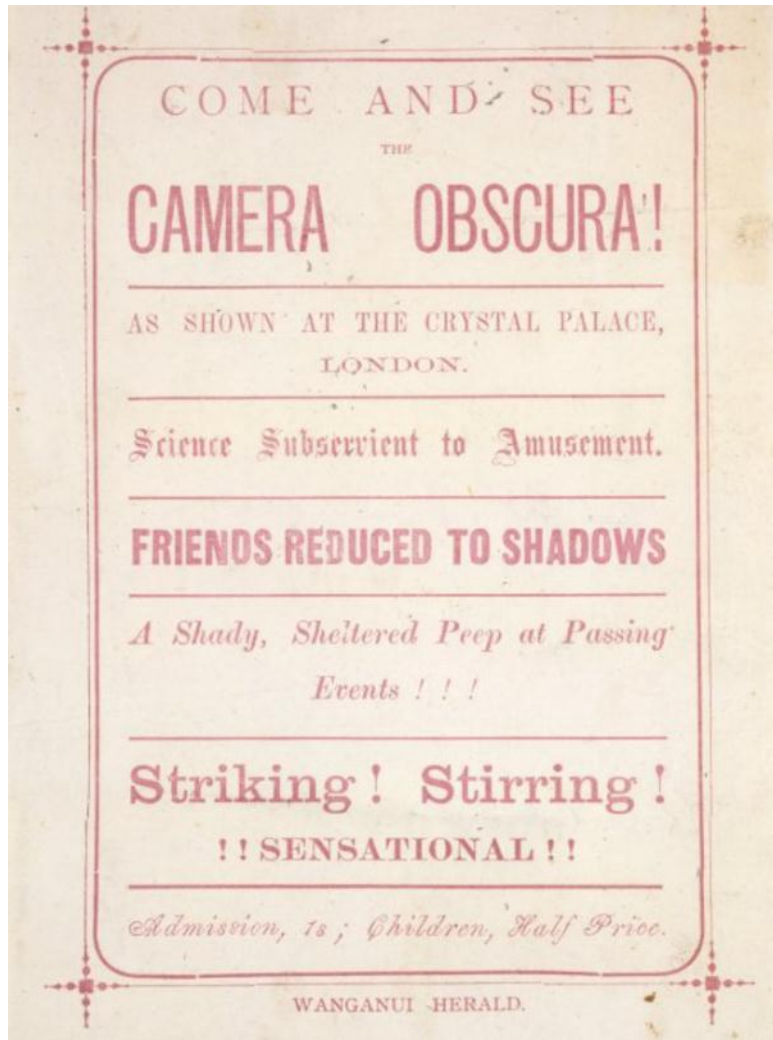


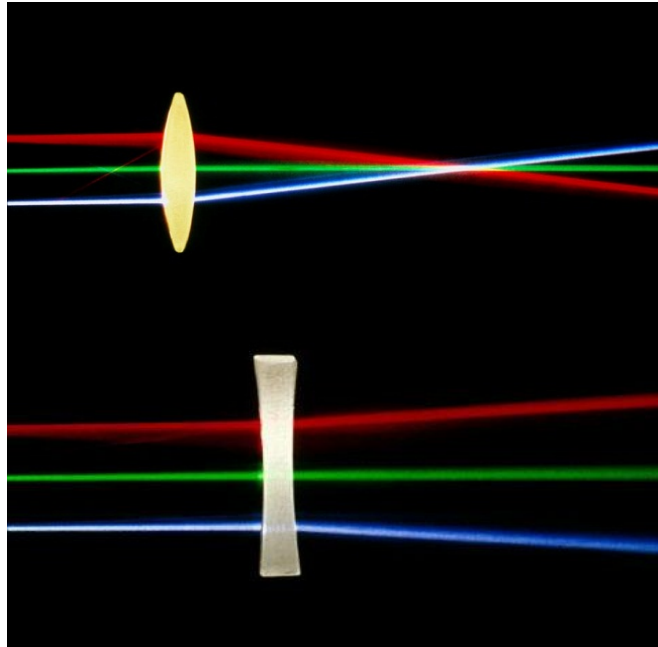
Figure 30: A flyer from a traveling camera obscura that came to Wellington in 1880. (timeframes.natlib.govt.nz, 2013)

The exhibition is comprised of six segments which include an introductory diagram, mirror and lenses display, periscope, camera obscura main attraction, Wellington panoramic views, and historic Wellington photographs. The exhibition could start from the right side of the staircase, continue around the back, and end on the left side of the staircase, so that visitors are moving clockwise through the exhibition as seen in the layout in Figure 29.

We suggest that the first segment provides a wall-mounted diagram and a description of the installed camera obscura to show how it works. If the roof-mounted camera is chosen, we recommend providing an explanation of how the image is produced and the camera's use of lenses and mirrors to correct the image. An example of the wall diagram can be seen previously

in Figure 6. If the window-mounted camera is chosen, however, we recommend having an explanation of why the projected image is inverted and the historical significance of a camera obscura. This segment can potentially include information about the discovery of camera obscuras by Aristotle and its use throughout history. The diagram showing an inverted image produced by the window-mounted camera obscura may spark interest in students attending educational programmes. This could inspire discussion among peers and the museum educator about why this is so, which connects directly to the key competencies of ‘participating and contributing’ and ‘thinking’. Furthermore, these competencies allow for critical thinking and discussion about the use of optics in the exhibition. We believe the diagram and explanation will provide both general visitors and educational groups with the initial context required to grasp the idea of the exhibition and the principles behind the camera obscura. This suggestion is supported by the evaluations of visitor interaction with the model. Similar to how the flyers provided initial context and increased interaction, this diagram can serve the same purpose and increase *visitor comfort* in the exhibition.

As the visitor moves along, we recommend that the next segment of the exhibition be an interactive display involving mirrors and lenses. The purpose of this feature is to teach visitors how the image they will see from the large scale camera obscura is produced. The first part of this segment can demonstrate how light bends, refracts, and reflects. We suggest providing an explanation on how convex and concave lenses produce different images. We would like to inform visitors as to why the image in the diagram previously seen appears corrected or inverted, depending on the type of camera obscura chosen. One suggestion for a model that teaches this concept is to present a table with a series of lenses, both convex and concave, on sliding tracks. A fixed object is placed in front of the lenses and visitors are able to move the lenses along the track to see how the distance affects the image. By having multiple lenses, visitors can also learn how size and type of lens affect the image produced. Figure 31 shows the principles of how lenses bend light that can be taught through the interactive display.



**Figure 31: How lenses bend light. Top: A convex lens showing light focusing. Bottom: A concave lens showing the dispersion of light.**

A second suggestion for the mirror and lens segment is an interactive mirror display that explains how mirrors are able to reflect images and ultimately correct the inverted image of a camera obscura. We suggest that this interactive mirror display use a peg board with mirrors or reflective boards that can be moved revealing different set-ups. To complete the display, a button to turn on a light source could be available for when the mirrors are in place to see how the visitor's mirror arrangement affects the light. Finally, a place for the light to end can be designated inside the display to provide a challenge for visitors. Figure 32 shows the basic set-up of the mirror interactive display.



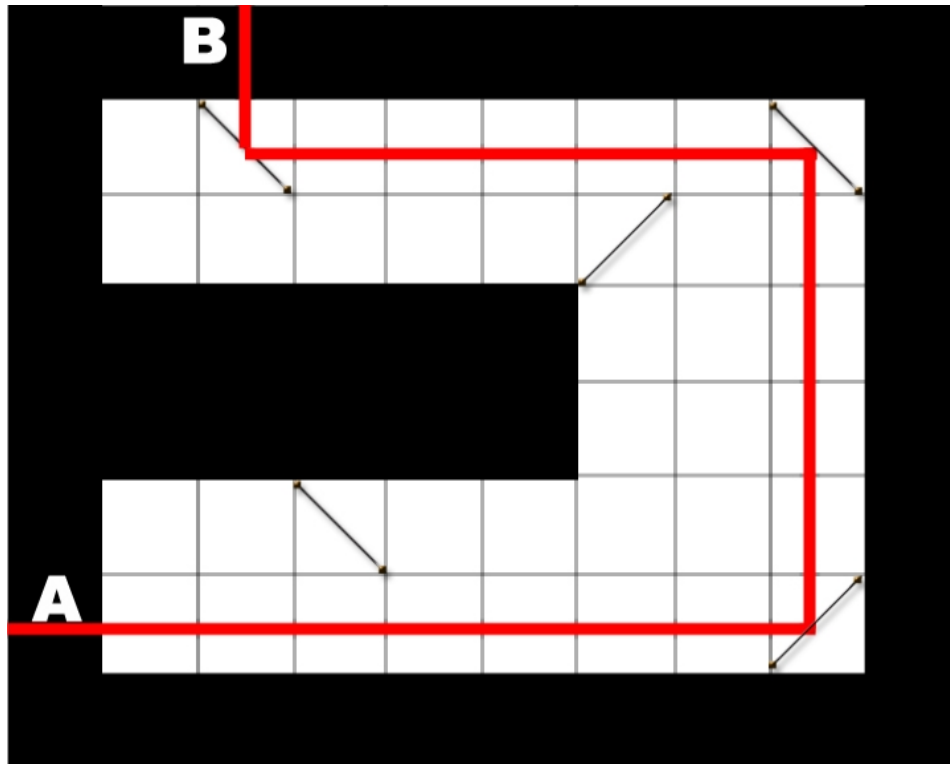


Figure 32: Sample of interactive display that teaches how mirrors reflect light.

The mirror and lens segment we suggested incorporates general interactivity and teaches visitors using a hands-on method which targets hands-on learners and students that visit the museum. Additionally, this low-technology segment will provide *visitor comfort* and increase their retention of information through interactive qualities. From an educational stand point, this segment will also fulfil the Science objective of *the physical world* and the Technology objective of *technological knowledge*. The understanding of *the physical world* is derived from learning how light bends, reflects, and refracts using mirrors and lenses in addition to how focal length determines the produced image. For *technological knowledge*, the high level of interactivity in this feature invites students to discover what is happening from a mechanical stand point. While these models will be simple, they will be able to show students the importance of visualising natural phenomena.

To add interaction in the exhibition, we suggest placing a periscope in the corner of the lit space. Despite the periscope currently being in storage at the museum's Collection Store,

David Waller, the Collections Manager, believes it can be refurbished to full working order for the exhibition. The periscope can be seen in Figure 33 below.



**Figure 33: Periscope from the Collection Store for possible refurbishment and use in camera obscura exhibition.**

We recommend allowing the periscope to rotate a full 360 degrees to provide a more realistic experience for visitors when interacting with it. Since the windows in this section of the top floor are partially blocked, we recommend that the periscope looks at an artificial 360 degree panoramic view from Wellington harbour as seen below in Figure 34.



**Figure 34: Potential view for the periscope from the harbour.**

Finding a panorama from a year when the periscope was still in use would add historical value, but could be difficult to find, so a present day view could also be used. We would like the visitors to have a view that they usually cannot see from inside of a museum to provide a *new way of seeing* Wellington's harbour through a realistic periscope view from sea.

The periscope could ideally be set up for an adult visitor's height since the target audience's age is around thirty-five. However, we suggest providing a platform for children to stand on to ensure they have a chance to interact also. The recommendations for this segment are designed primarily for interaction and a *new way of seeing* Wellington rather than for educational purposes. Therefore, we do not suggest having a write-up corresponding to the periscope other than a short description of the periscope and panoramic view. Since the five-sense experience increases visitors' retention of information, we also suggest providing sounds such as waves, seagulls, and boat horns in this section of the exhibition. The sound can either be constant, such as with the Bond Store exhibition, or heard after pushing an interactive button, like those found in Telling Tales. Additionally, the periscope is an option that is low-technology and easy to use, which are two characteristics found through the literature that promote *visitor comfort* while in exhibitions.

Having a section of the camera obscura exhibition that relates only to entertainment and interaction is useful for visiting families that may have several ages in the group. During the interactive interview, we found that because most children are done viewing the exhibition before adults, adults often rush through the rest of the exhibition. This purely interactive recommendation for the camera obscura exhibition can potentially provide a place for children to play while adults read the historical facts provided. The periscope can also help engage students when attending an educational programme at the museum.

Similar to the Wahine and Pepper's Ghost exhibitions, we recommend implementing a staggered entry to the next section to create a darkened environment for the camera obscura and backlit panoramas, refer above to Figure 29. The image produced will either be projected on the wall opposite the windows or from above onto a circular table. Depending how the image is projected, different interactive aspects can be implemented. For the roof-mounted camera obscura, the image will be projected on a round white table, so we suggest providing

hand-held interactive objects for visitors to use. Similar to the Children’s Museum and Theater of Maine, options could include square pieces of white paper available for visitors to place over the white table. To give the illusion that a car is driving or a person is walking over a ramp instead of on flat land, visitors can fold the piece of paper and place it on the table. Similarly, visitors can seemingly lift a person or car off of the table by using the paper to lift part of the image.

In addition, we suggest providing a black and white sketch of one section of the camera obscura view for visitors to place over the image. This can be engaging for all age levels and demonstrate how camera obscuras were used in the past. Figuring out where the sketch fits in the image being projected can be somewhat of a puzzle for children. This will get students to think both critically about where the sketch fits and creatively about how this could be used for artistic purposes in order to fulfil two components of the ‘thinking’ key competency. Finally, if a movable lens is used in the camera obscura, we suggest allowing visitors to change the focus to engage them in the display even further. For a window mounted camera obscura, similar interactive suggestions can be integrated into the section, but we also suggest encouraging visitors to interact with the projected image on their own arms and hands. This will enable visitors to seemingly move cars and people around by just moving their bodies.

The next segment, located within the same dark space, can include hanging several panoramic images of Wellington’s city and harbour to contribute to our overall theme of *Capturing Wellington’s Changes*. From our visit to the Collection Store, Waller revealed that panoramic photographs dating back to 1858 available at the store could be scanned at high resolutions for use in the exhibition. We suggest printing the images as transparencies so they can be backlit in the dark room and provide a *new way of seeing* photographs and Wellington. We would like to incorporate photos or illustrations from the past and present for comparison purposes, allowing visitors to reflect on Wellington’s changes over time. Figure 35 shows two panoramic photographs taken from the same place in Wellington at two different times. The bottom picture in Figure 35 is from 1885 and the top is from 1923, revealing a gap of about forty years between the photographs.



**Figure 35: Photographs from the Collection Store of Wellington from 1885 and 1923.**

To keep the same interval, we suggest finding a photograph from around the year 1965 and 2005 taken from a similar place in the city. These four photographs next to each other show the progression of Wellington over the last 120 years. Uncovering these specific photographs can be very challenging, however, so if the pictures are not possible to find, a present day photo can be taken for the display. A second example of a possible backlit image is another photograph from the Collection Store of Queens Wharf in the past. The photo features three different sections of Queens Wharf and can be seen below in Figure 36.



**Figure 36: Photographs from the Collection Store of the view of Queens Wharf in 1858, 1879 and 1914.**

Figure 36 shows a collection of three images from the years 1858, 1879, and 1914 respectively. These images compiled show a time lapse of Queen's Wharf from Wellington Terrace. We suggest using this photograph because the museum has been located on Queens Wharf since the Bond Store was built in 1892. Therefore, the Bond Store was erected between the time when the second and third photos were captured. Unfortunately, the third photo from 1914 does not include the museum building, but it does show ships docked and goods being transported. Therefore, through this option, visitors can have the opportunity to connect the unique views provided by the exhibition to the history of the Bond Store on the Wharf. From an educational standpoint, the reflection on these photographs and their changing view over time connects to the Social Sciences learning area. For curriculum level three, it connects to the objective of "understanding how people view and use places differently" and the curriculum level four objective of "understanding that events have causes and effects."

To connect to Wellington history as well as optics and photography, we suggest a segment featuring Zak Studios. One of Zak's photographs shows a camera obscura that was moved from Christchurch's Wonderland to Wellington. This is a different camera obscura than the one advertised in Figure 30 seen above, revealing an history of camera obscuras in Victorian Wellington. This Wellington connection to Christchurch can be highlighted for school groups visiting from the Canterbury region, which includes Christchurch and had the highest number of school visits outside of the Wellington region, refer above to Figure 12. The Zak photograph of a camera obscura in Wellington in 1908 can be found below in Figure 37.



**Figure 37: Zak photograph of camera obscura from the Christchurch Exhibition in Wellington.**

The write-up for this photograph could briefly explain the use of camera obscuras for centuries as attractions worldwide and its historical presence in Wellington. This segment will not only tell the story of Zak's photography, but also the stories of the buildings and areas that define Wellington's past and present. Another possibility is having other Zak photos be paired with pictures of current-day Wellington in the same settings to once again allow visitors to reflect on Wellington's changes. An example of this can be seen below in Figure 38, where a Zak photo and a present-day photo were taken from the same location.



**Figure 38: Images of the Bank of New Zealand building at the corner of Lambton Quay and Willis St in Wellington. Above: A Zak photo from 1908. Below: A photo taken on 16 Feb 2013.**

This segment will be able to connect to the same Social Science objectives in the New Zealand curriculum as the backlit panoramic images. Additional Zak photographs that could be re-photographed for the exhibition can be found in Appendix M.

Although the segment featuring Zak Studios brings the visitor to the end of the allotted exhibition space, we have additional camera obscura related recommendations for the activities table. Since this part of the room has windows overlooking the harbour, a different view from a camera obscura is available for visitors. Therefore, we recommend providing small hand-held camera obscuras for use in this area, similar to the interactive model we built. Being able to hold the camera itself and use it for different views from the windows can show children that the image is real-time. This will also allow visitors to engage in figuring out *how it works*, the interactive category observed most during our formative evaluation on the camera obscura model. In addition to the model, we suggest having build-your-own pinhole cameras available as an activity for the table. These pinhole cameras work similarly to the camera obscura and can provide a unique opportunity for children to build and use their own models. We suggest that children take their models home with them to continue exploring the concepts of the camera obscura. These are two hands-on and easy to use examples that encourage interaction and creativity, both of which were found to be important aspects of a museum experience.

To expand the activities table, a simple sketch of part of the view from the camera obscura could be made available for children to replicate. Children could sketch the picture in black and white then bring it into the camera obscura room to find where it fits. Once they have viewed the sketch overlaying the camera obscura image, they can bring it back to the table and colour it in or draw what they saw happening on the street. One of the walls by the activities table could be dedicated to displaying the children's sketches. Having their artwork displayed for other visitors to see is exciting for children, and if they choose to visit again with their family, they can have something that they created to show others. This idea could possibly be incorporated into the educational programme for the exhibition because it would increase the level of *hands-on* and *craft projects* aspects that some teachers thought could be improved. It



could also be available at the activities table during weekends and school holidays or other times when there are more children visiting the museum.

To tie all of the different educational experiences we have discussed throughout the exhibition we developed a brief educational programme card, like the one the museum has for the Wahine programme. This programme card can be found in Appendix O, and briefly describes what the programme could include and the New Zealand curriculum connections to the exhibition.

This concludes our recommendations for the interactive and educational experiences of the camera obscura exhibition. Each segment was specifically designed to have a purpose for both general visitors and educational groups, as supported by our findings, analysis, and the literature we reviewed.

## MARKETING STRATEGIES

Continuously marketing and promoting the museum and its exhibitions on a modest budget can be difficult, but the museum's marketing staff has developed creative ways to work with the allocated budget. Since the museum's most effective media currently in use is the signage they place outside their building followed by word of mouth and brochures, we suggest continuing the use of these media to promote the new exhibition. We found that most survey participants that heard about the museum through brochures were international visitors so brochures are an effective way to reach tourists from outside New Zealand. However, we found that visitors do use television, newspapers, radio, and Google most often as sources of information, so we recommend utilizing these media for a more effective marketing approach. We also suggest that the museum develop a brand or memorable label for the exhibition because, as discussed in our analysis, a promotional campaign would be more effective if it had a recognizable brand. Therefore, any promotional material developed for the camera obscura would include the brand suggested.

For promotion of the camera obscura exhibition, we suggest advertising the grand opening on a large scale. We recommend contacting news stations around Wellington, such as Channel 3, to inform them of the opening and suggest featuring a story on the exhibition. Although this type of promotion is often free, it could prove difficult to get coverage because

stories covered by news channels often depend on what else is happening at the time. However, if the opening of the museum does receive news coverage, it would be either free or at a low cost to the museum's budget. Television is also the most commonly used medium according to our marketing survey, so this type of promotion has the potential to be very effective.

We also suggest developing newspaper and radio advertisements because they were two other top media sources used according to our marketing survey. The advertisements can focus on the opening of the new exhibition so the advertising campaign would not be long-term therefore reducing costs. Advertising in the local newspapers such as the Dominion Post and The Press would be an effective way to reach potential visitors (Dominion Post.co.nz, 2013). For the newspaper advertisement, we suggest the museum continues pursuing package deals that include advertisements and editorials for a combined cost. The museum could also contact a New Zealand radio station that has a similar target audience as the museum, between the ages of 20 and 35, to play a short advertisement. To keep costs low, we suggest airing the advertisement one week prior to the opening of the exhibition and for one week after the opening.

We also suggest that the museum place a short description of the exhibition in the museum brochure since it is one of the top ways visitors find out about the museum. This could be an effective way to inform tourists of the exhibition. Additionally, it can be low cost for the museum if they slowly resupply distributors with the new brochures.

Although the majority of the museum's followers on Facebook are past visitors, creating an event for the exhibition's grand opening would inform followers of the new exhibition. The followers could then spread the word through either social media or word of mouth. Since word of mouth is one of the major ways people hear about the museum, we believe that using Facebook would be an effective way to inform the public of the opening. Another online tool, TripAdvisor, was proven to be an ineffective way of reaching potential visitors because of its extremely low ratings on the marketing survey. Only one participant learned about the museum using this media source. However, we suggest continuing the use of the account and using it to promote the opening of the exhibition. We recommend creating an event on the site that lasts

a couple of months to maintain an extended promotional period. The post on TripAdvisor may also show up on Google by searching a relevant topic. This is beneficial because Google was one of the highest ranked media for visitor interaction and reliance, yet not many participants learned about the museum through it.

Since we found that museum signage was the main way participants learned about the museum, we suggest designing an outdoor sign for the camera obscura exhibition. This sign can be designed similar to the knee high signs already in use at the entrances, but we suggest producing a larger, more colourful sign to draw people's attention. Through our model evaluations we found that not many visitors recognize the phrase 'camera obscura', so the sign could instead pose an engaging question. A possibility can be the question used on our table flyers for the model evaluations, 'Have you seen Wellington upside down lately?' that can be seen in Appendix D. We recommend placing the phrase, brand, or logo developed for the exhibition on the signs to match the other related advertisements. However, we do not suggest including text about the exhibition opening on the museum signage so that the sign can be used for long term promotion.

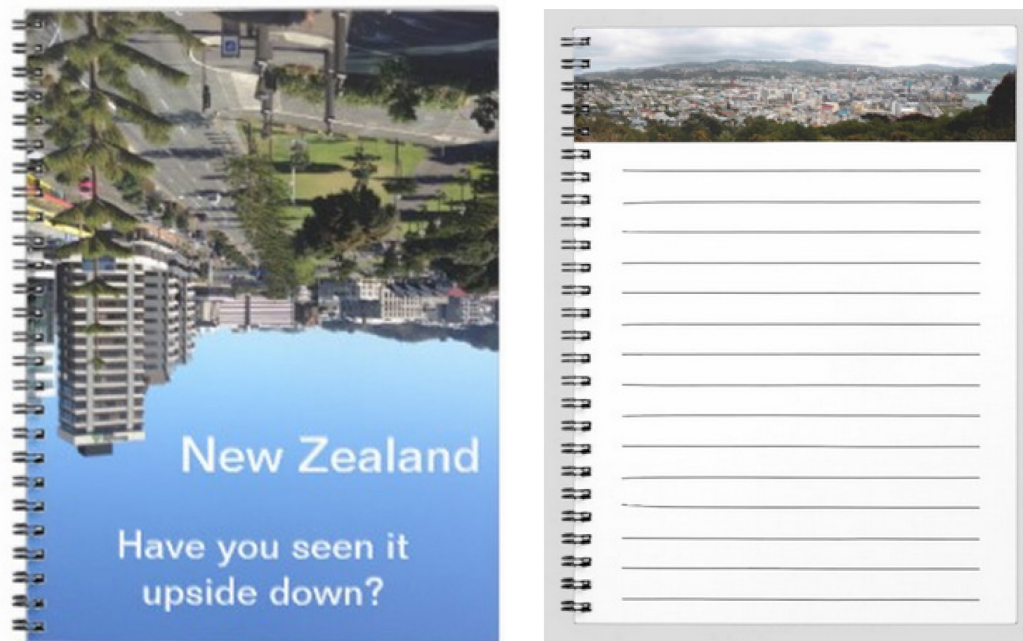
As another long term marketing effort, we suggest using historical dates as the museum has in the past to promote the camera obscura exhibition. As noted above, Zak's work can be incorporated into the exhibition for historical purposes, so his birthday can be used as an annual event to increase or reignite the interest in the exhibition. On this date every year, the museum could celebrate by offering free and specialised tours for the camera obscura exhibition. This marketing strategy is in line with the existing practices of the museum and would serve as a long-term solution for promoting the exhibition. A similar strategy is already used for the museum's Wahine Disaster exhibition, which, according to the marketing team, has drawn in more visitors and increased community interaction.

## GENERATING REVENUE

### *Retail*

Developing a marketing plan that both invites visitors to see a new exhibition and also stimulates long-term interest can be a challenge for the retail space. We found that stationary items and coffee table books are the most popular items in the museum's retail shop that can

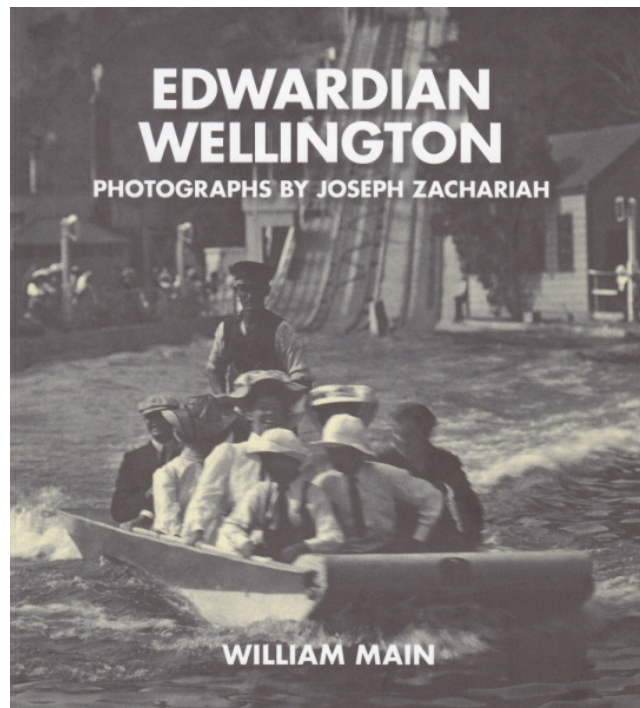
be best related to the camera obscura exhibition. Therefore, the museum can publish a notebook and pen package that is New Zealand branded and camera obscura related. This is possible since stationary items are highly customizable and are currently one of the most profitable items sold in the retail shop. Placing 'New Zealand' on the cover categorizes the set as a New Zealand branded souvenir, increasing its profitability since they were found to be the most popular items sold in the retail shop. The view from the actual camera obscura or another scenic New Zealand landscape on the cover will make it appealing to any visitor and also representative of the country. We suggest that the image be inverted to stimulate curiosity and to show how it would be viewed through a natural camera obscura. This would increase its uniqueness and relate it back to the exhibition. The top of each page can have a panoramic view to maintain the appeal of the notebook, an example can be seen below in Figure 39.



**Figure 39: Example of suggested exhibition-specific notebook.**

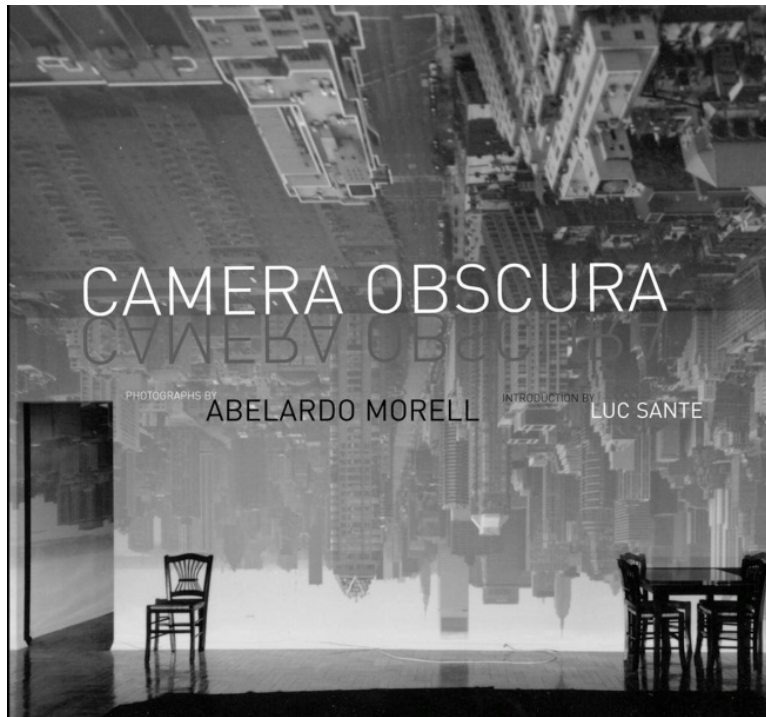
Placing a different image on each page can be expensive, so separating the notebook into sections by changing the background at page intervals of twenty or fifty could reduce costs. The pen included in the package could be decorated with the same or similar image as the cover.

Coffee table books are one of the most profitable and most successful items in the retail shop. However, through our interviews, we found that there are issues with the profitability of in-house designed books. Therefore, the museum can offer existing books relating to the exhibition to increase profitability and eliminate the risk surrounding in-house books. One suggestion is a book about Zak's Photography called Edwardian Wellington, by William Main, which starts with a short biography and concludes with a collection of his photographs. The cover of this book can be seen below in Figure 40.



**Figure 40: Edwardian Wellington, a possible book for the retail shop that relates to the camera obscura exhibition.**

Another option is including a book similar to Camera Obscura by Abelardo Morell, relating directly to the exhibition's main attraction, which can be seen below in Figure 41.



**Figure 41: Camera Obscura, an exhibition related book that could be sold in the retail shop.**

In general, books sold should have content that can be just loosely related to the exhibition; therefore, anyone can look at the book and be entertained. Our research revealed that supplemental books such as these require brief and simple descriptions of the images to maintain the reader's attention while still sparking their interest with stimulating information.



Figure 42: A pinhole camera kit that could be sold as a camera obscura related toy in the retail shop.

The museum could also sell pinhole camera kits as exhibition related toys, such as the one seen above in Figure 42. These kits are great options for children because they are low-cost and easy to assemble. These items offer a fun and unique way for children to bring the camera obscura experience home with them.

### *Guided tour*

We suggest that the museum develops a tour that is focused around the mission of the camera obscura exhibition, to provide *a new way of seeing Wellington*. A tour could be developed in association with the Wellington Cable Car and the Carter Observatory. We would like the tour to be about two to three hours and include a tour of the camera obscura exhibition, a coffee or tea break in the Coronation Café, a cable car ride, a tour of the Carter Observatory, and a planetarium show. A proposed tour route is visualized below in Figure 43.



**Figure 43: Visualization of the proposed tour route including the Museum of Wellington City & Sea, Wellington Cable Car, and the Carter Observatory.**



The tour will begin in the camera obscura exhibition where the guide can enhance visitor's experience through interaction and further explain the camera obscura's history focusing on its use as an astronomical tool. The tour could take a coffee or tea break, which gives visitors the chance to relax and explore the retail shop. Next, visitors will ride the Wellington Cable Car, which provides passengers with a panoramic view of the city, much like those suggested to be included in the exhibition. The cars leave every ten minutes, so coordinating with the cable car would be easy and it would serve as a means of transportation to the Carter Observatory. The Carter Observatory can be included in the tour as it relates to the science and technology material of the camera obscura exhibitions. Once at the observatory, we suggest talking about the progression of astronomical equipment with a visit to the observatory's advanced telescope. Visitors can then be brought into the planetarium show to conclude the tour. The observatory also charges an admission fee, so including entry in the cost of the tour would add value from the visitor's perspective. Ending the tour at the Carter Observatory would provide a chance for visitors to browse their retail shop.

### *Advertising guided tours*

Advertising the new guided tour to tourists and cruise ship passengers is significant to its success. The museum could develop a small flyer, similar to flyers they use for other tours, for the new exhibition. The museum could also develop A4 posters that highlight deals using images and little text to attract potential visitors. Examples of a tour flyer and A4 poster for the exhibition can be found in Appendix P. Another important part of marketing these tours is making sure the staff selling the packages has experienced the tours themselves. This allows them to provide a better recommendation because they understand what is being offered and can give personal opinions. Since the tour sales are the highest during cruise ship season, we suggest offering specials along with the tours such as coupons for the retail shop or café. This will not only make the tour more appealing because visitors feel like they are getting more for their money, but it also encourages them to visit the shop and café.

## 5.2 CONCLUSION

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Developing a new exhibition takes considerable planning and preparation. Being new to both the museum and the Wellington area, we experienced first-hand what it means to be a visitor and were given the chance to see behind the scenes. The idea to bring a camera obscura exhibition to the museum included developing educational and interactive experiences and a marketing plan that complemented the Trust's *new way of seeing* concept. Since the exhibition is part of a larger redevelopment plan for the Museum of Wellington City & Sea, it was important to refer back to the *new ways of seeing* concept and to connect this vision to the social history theme of the museum. Coming from science-related rather than museum studies backgrounds, we were able to offer an alternative interpretation of the camera obscura exhibition. By combining our technical knowledge to build the model and develop science-related educational material, we have attempted to expand what the museum can offer to its visitors by connecting science and technology to social history. Having little experience with museums before this project, we believe our objective standpoint was helpful in providing useful and informed recommendations for the exhibition. We believe our recommendations could engage visitors with thought provoking experiences, highlight the city and harbour through new attractions, and contribute to Wellington as the cultural capital. Through this, the Trust's vision and *new way of seeing* concept are accentuated in our recommendations for the camera obscura exhibition. Finally, by welcoming us to their community, the remarkable museum staff gave us an invaluable opportunity to work across disciplines and gain valuable work experience in a professional setting.

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## APPENDICES

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### APPENDIX A: INTERVIEW WITH RACHEL INGRAM

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#### *Questions for Educational Interview*

**23 Jan 2013**

1. Can you give us an overview of the educational programs that you offer?
2. Do you find that other museums in the area focus on the same things and offer similar education programs?
3. In the surveys and post visit reflections you have listed both the program and the focus of the visit. Can you explain these in a little bit more in depth, like are the programs you already have developed and the teachers have a specific focus for the visit or whatever it maybe?
4. Do you find that teachers make trips here an annual or reoccurring thing?
5. How many teachers actually fill out the survey monkey?
  - a. Do returning teachers fill out the survey after every trip?
6. How often do you have combined museum visits with the Cable Car or the Colonial Cottage?
  - a. Do you partner with all of the other museums in the Trust?
  - b. Do you still organize the trips or is there another educator that plans the trips at the different museums?
7. For current programs that you offer, how do you integrate the New Zealand curriculum directly into these programs?
8. When teachers look into the museum for a visit, what are they looking for? Are they looking for curriculum integration or are they looking at the exhibitions and what material is there?
9. What school levels do you find to be the most common for visits?
10. How often do you have school groups come in during the school year?
11. We are developing a camera obscura exhibition and for educational programs it has been suggested to us that we could get university and secondary groups in because of the material, do you think that this type of exhibition would be attractive to primary school groups as well?
12. What do you want out of a camera obscura exhibition that you would be able to market to teacher as a new educational program for MOWCAS to offer?
13. What would you like to see in this exhibition that can be related to school visits?

## ***Meeting Minutes***

What do you do?

- Task of tell the story of Wellington in an innovative fashion.
- The history of Wellington for students groups age 5-13.
- Drama, music are new ways. Through story-telling, films, student writing, telling the idea 'new ways of seeing'. Human condition to a point including the story of Wellington. This is not able to be done in a classroom. So they need to be done outside the classroom. For a different experience and perspective. In a museum a liberal playing field who can access the information in different ways.

Learning Experience outside of the classroom (LEOTC)

- a program with the Ministry of Education. Gets funding through the Ministry of Education, it needs to meet certain objectives of the NZ curriculum.

Content and Structure.

- Has a framework that delivers the curriculum aligned, program are a cross curriculum where it combines several aspects.
- All of the LEOTC focuses on the curriculum, has to report, monitor the objectives and competencies.
- 4 Social History museums: Te Papa , Museum of Wellington City & Sea, Petone Settlers, and Porirua's Museum of Arts and Culture. Each with a different history theme.
- Cannot get double funding from the government. (Either LEOTC or another type of funding)

Post-visit evaluations: the program and focus.

- The program is something we develop for student groups.
- The focus is what teachers what to look at. Look at the consequence, how it was important, sources, etc. It is good to focus the program to these objectives.

When developed the program?

- Personalize every visit.
- Phone call or email inviting them to tell what they want in order to tailor the program.
- 60% Wellington central 40% national visitors.
- With local and regional, have a planning meeting and visit in order to know what they want or what they can offer. That way they can see the exhibition before.

Programs:

- Wellington as a capital city (for nationals)
- Wellington as a place where you live (regional)
- Myths and legends, crafty type activity afterwards. After Wellington Library or refer them to other areas.
- Wahine
- Near the sea, over the sea, at the sea, etc.
- Finding out the history of the city and then move on transportation, suburban, reclamation, and it can go over several topics.

LEOTC. Certain programs or things change based on the current educational programs from the central government.

#### Reoccurring or not

- 170,000... 222 students per week. Might change per week.
- Try to not turn people away.
- Some come for different focus several times per year
- Others come every other year or other depending on where they are from.

#### Survey Monkey

- It is optional, so about 60%
- Self-addressed copies may be more effective
- Trying to get more people to fill it out due to their time commitment.
- Groups that come again might be more able to fill it out. They feel an attachment to the museum and tend to do it more often.

#### Partner with museums (how often are combined visits)

- Tricky, inventive to convince the Ministry it is a dual visit and not a single one.
- A lot of out of town tend to make it like this.
- Better way of getting a deal out of it.
- Shelley pull out education files and Excel files are if they are double programs or not.
- Program with Capital E and City Gallery and Carter. Regional and out of town. How to use iPod with filming in Carter, Museum of Wellington, and Cable Car Be able to view film. Cross-trust museum experience.

#### Team in each museum

- Cable Car and Cottage are also part of Museum of Wellington.
- Leading people with teaching experience but people are keen with interactive with people and not necessary teaching experience.

#### How to integrate competencies with LEOTC

- Focus based on the meaning areas of each guide
- Assignments/skill in order to focus program with it.
- Unique way to complement teaching, but is able to look at the curriculum. Achievement standards that are useful for students.

#### Teachers why they choose museum

- Some people come for tradition and not for what it is now.
- Other people come to look for time constraints and try to tie it with what they have done
- May come back and may tweak.
- Others love the museum and make the museum fit the topic or topic that fits the museum.
- Lot of word of mouth. For new schools guides. Teacher to teacher or kids.
- After school visits that came with school, come with family

#### School levels

- Pull from the excel.
- 7-8 intermediate age group
- 280% 1,2,3 age group.
- 5-6-7-8 are the most popular.
- Report was to tell what percent came for each group

#### Camera obscura guide

- College or high school is more suited? What about with elementary?
  - o Yes



- LEOTC doesn't go up to college. Goes up to 13.
- 5-6-7-8 is pushed in the science area. Need more science in school groups.
- Ministry wants to push the science areas more.
- Maori achievement education success... Pacifica
- Maori are more about oral and embracing culture instead of learning from books.
- May be able to help 5-13 in order to increase science education groups. Have more group tours
- Science should be added to the museum.
- Pepper's ghost would be a good engagement for people to learn how it works.
- Science would be a good component to add. Carter and the relationship with social story with people and their achievement.
- Science and Social Science aspects are important. New ways of seeing the past and present. It should help to know how it works.

Interactive material for supplemental material

- Things that could be felt or look.
- It is good that they can touch and use.
- The use of periscope and telescopes that they interact with it.
- Damage is minimal compare to interaction or how it works.
- Slide shutter and have different views?
- Learn how it inverts it and show both ideas.
- Problem solving skills and helps a lot.

Shift in age group and visitor group by adding a science component to the exhibition.

Get students to come and test model

Get a panel of teachers

LEOTC has expert group teachers that are experts and monitor programs in the past.

Museum website- learning- programme- colonial cottage/wahine

Camera Obscura is suitable for school level 6 and up

## APPENDIX B: TELLING TALES INTERVIEW QUESTIONS

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Time Spent in Telling Tales: \_\_\_\_ - \_\_\_\_      How many visitors: Adults: \_\_\_\_ Children: \_\_\_\_

Observe what they did:

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What was your favourite part of the exhibition? Why? (Did you find this more entertaining or interesting?)

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What did you find to be most (entertaining / interesting) in the exhibition?

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What do you think could have been improved about the exhibition?

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What sensory experiences did you have in the exhibition, for example seeing, hearing, touching, smelling, or a combination of these senses?

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Did you learn anything new from the exhibition? If yes, what?

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What methods do you learn best through?

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Where are you from (optional): \_\_\_\_\_

Age (optional):      -16                      18-30                      30-50                      50+

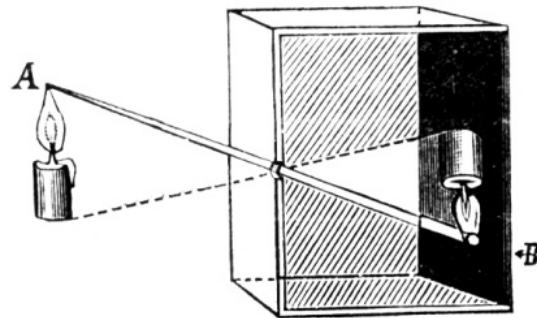
## APPENDIX C: TELLING TALES EXHIBITION BREAKDOWN

Year	# of senses	What senses used	What exhibit is about
<b>1913 room</b>	3	<b>Vision</b> (read, watch video) <b>Hearing</b> (listen to video) <b>Touch</b> (burlap bags)	Video projected onto burlap bags; letters displayed on/in old wooden boxes; protest flags hanging down from the ceiling
<b>1912</b>	1	<b>Vision</b> (read, watch video)	Video with no sound and description written above about a Dolphin named Pelorus Jack
<b>1922</b>	3	<b>Vision</b> (read) <b>Hearing</b> (listen to bird call) <b>Touch</b> (button)	Push button to hear a bird call with a description written above about protecting native birds and sanctuaries
<b>1923</b>	2	<b>Vision</b> (read, x-ray) <b>Touch</b> (button)	Push button to illuminate lung from TB patient with description written above
<b>1931</b>	3	<b>Vision</b> (read description) <b>Hearing</b> (hear car horn) <b>Touch</b> (button)	Push button to hear honking with description above about Mount Victoria Tunnel being opened and dug up
<b>19353</b>	3	<b>Vision</b> (read, blender moves) <b>Hearing</b> (grinding noise) <b>Touch</b> (button)	Push button to turn on blender noise with description above about the spread of Tip Top brand ice cream
<b>1936</b>	1	<b>Vision</b> (read, watch video)	Video without sound and description above about NZ winning the Bledisloe Cup after losing to Australia
<b>1938</b>	2	<b>Vision</b> (read, train moves) <b>Touch</b> (button)	Push button to make train move and description above about 100km regional train installed
<b>1945</b>	3	<b>Vision</b> (read, watch video) <b>Hearing</b> (listen to music) <b>Touch</b> (hold phone to hear)	Video with sound on phone – played music only, black and white video; description written above about increased interest in music
<b>1959</b>	3	<b>Vision</b> (read, watch video) <b>Hearing</b> (music and talking) <b>Touch</b> (hold phone to hear)	Video with sound on phone – music with talking over it; spoken and written description about Wellington festival
<b>1965</b>	3	<b>Vision</b> (read, watch video) <b>Hearing</b> (spoken description) <b>Touch</b> (hold phone to hear)	Video with sound on phone – spoken and written description about troops in Vietnam

<b>1969</b>	1	<b>Vision</b> (read, watch video)	Video without sound (more modern; bright colors and water fountain)written description above about Cuba Street
<b>1973</b>	3	<b>Vision</b> (read) <b>Hearing</b> (song plays) <b>Touch</b> (button)	Push button and plays a short song from an old radio with written description above about radio becoming popular
<b>1983</b>	3	<b>Vision</b> (read, watch video) <b>Hearing</b> (elephant noise) <b>Touch</b> (button)	Push button to hear elephant noise with description above about elephant; Video without noise attached to elephant harness across from description
<b>1987</b>	3	<b>Vision</b> (read, watch video) <b>Hearing</b> (spoken description) <b>Touch</b> (phone to hear)	Video in color with sound on phone, spoken and written description about market crash
<b>Cinerama Corner Display</b>	2	<b>Vision</b> (read, watch video, lit camera roll, neon sign) <b>Hearing</b> (spoken description)	Video with sound, spoken and written descriptions, illuminated camera roll and neon sign that says Cinerama

*Wall Write-Up*

## An Old New Way of Seeing



Camera obscuras have been known since ancient times. They provided a new way of seeing and can be as small as a handheld box or large as a room.

Light from objects is naturally inverted when passing through a small opening so the screen shows an upside-down image of the surroundings. Did you know that the eye also produces an inverted image which is later corrected by the brain?

Wondering how this model works? It is easy to use. Select a view, try adjusting the focus and enjoy!

## An Old New Way of Seeing

Have you seen Wellington **upside-down** lately?



Experience this spectacular phenomenon first hand with our **camera obscura model** in the corner of the **Coronation Café**.

Just look inside to start observing what's around you. Then try rotating the camera obscura or sliding the screen with both hands to change the focus.

## APPENDIX E: CAMERA OBSCURA MODEL EVALUATION

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### Camera Obscura Evaluation

Date \_\_\_\_\_

Time Spent: Start \_\_\_\_\_ End \_\_\_\_\_

How many people are in the group? Adults \_\_\_\_\_ Children \_\_\_\_\_

How many actually use the model? Adults \_\_\_\_\_ Children \_\_\_\_\_

Do they look at how it works? \_\_\_\_\_

Did you see a “Hey Martha!” interaction? Explain.

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Did they interact with other pop-up displays in the café?

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Observe general visitor interaction.

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## APPENDIX F: INTERVIEW WITH MARKETING TEAM

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### *Marketing Meeting Questions and Minutes*

#### 1. Marketing:

- a. What marketing strategies do you use for the the Museum of Wellington City and Sea and the Trust?
  - City and Sea from the audience perspective:
    - Local visitors, local tourists, international tourists – attend in different seasons
    - Annual anniversaries: Wahine anniversary, road show in November, Captain Cook’s birthday, scavenger hunt within trust
    - Temporary exhibits (try for 14 per year): market according to season
      - Coronation Café is part of redevelopment but is marketed like a temporary exhibit
    - Prince Charles and Lady Camilla - unofficial birthday party with crown jewels got the museum on Breakfast TV twice in one week! Also offers The Right Royal Tour as a Tourist product
    - Continuously marketing for general admission
  - Don’t have big advertisements
    - Can’t afford it
  - They use free channels that are direct
    - **Online:** e-newsletter, e-alert, e-card, general emails, facebook, list events online (print listings correlate with them) event finder, pamphlets in hostels
      - Event Finder: ads picked up by other websites and its free advertising through those sites; Wellington Enzid was taken over by Event Finder – they were a trip advisor website.
      - Escalate profile by adding more events – post about activities and programs so they are passed on through Event Finder affiliated sites
      - City and Sea is on the second tier or choice for tourism groups (Zealandia, Zoo and Tepapa are first tier)
      - Coronation café was posted about on an e-card sent around by event finder, e-newsletter and the Facebook page
      - Jack’s Boat House is listed as a special event but it is actually open every day
      - A guest speaker or event is what promotes everyday exhibits
    - **Print:** Free ads, purchased ads, tiles for wifi, tourist maps have a point for City and Sea, provide photos for booklets and get to put City and Sea at the bottom (it’s like a full page ad without paying), ask for freebees (someone offers an ad for a certain amount and they ask for free test run first!), pay for ads in local papers and get free editorial
    - **Signage:** Banners, sign outside of museum, posters in libraries, stickers on pavement, flags, fliers, tele-fliers, dress up like dog and gave out fliers, old paper boys dress up at train station and hand out fliers that look like old news papers



- **iSite:** they have a good relationship with some of the sites so put the pamphlets there - ferry destination is popular and requested more; also use other information stands, hospitality places and rec centers

b. What aspects of the strategies are most successful?

When visitors enter, front desk asks: have you been here before and where are you from

**Opinion meter** – (survey sent to us already) the survey has those answers also but includes age also which is key for survey taking - older and younger visitors won't stop to take a survey whereas more tech savvy people would so **age group dependent**

- How visitors hear about museum: signage, brochures and word of mouth

National survey: they question every 3<sup>rd</sup> person about their visit (**Chris has online password for data**)

**Trialing online advertising** – Facebook “friends” increased by 50% when ads started going out – they pay \$1 for every new “friend”

**2. Advertising:**

- What is the story that you want to promote?
  - Camera obscura is a medium to get your story across – focus on architectural changes of Wellington
- Change name in October to be able to announce it at the festival because it's a large free public event - possibly run some kind of engagement to reveal the new name and they want to do it before annual listing

**Researching ways the Museum can generate revenue from the Obscura exhibit (What types are most popular. The structure of the tours. Has this been successful for one single exhibit)**

**3. Tours:** Ship 'n Chips, Tales & Rails, The Right Royal Tour, Personalised museum tour, Kid's birthday parties, Scavenger hunt

a. Which tours do you find to be most popular? (In City and Sea vs. with other Trust museums)

Tours are on an annual basis

There is tension between running tours and other parts of the museum because there are things to worry about like having enough educators, staff knowledge, staff availability...

Attracting people onto a free tour

Free tour offer to people at a certain time on Sundays not many people come!

A lot on cruise tour shore excursion ; the operators sell them to middle man then it ends at the cruise person; cruise ships easier than national bus tours

Independent travelers purchase them through isight - national local and international

Sell at door

Feedback: when they get a low rating they read the comments and try to contact the visitor!

They read about crown jewels low rating about the visitor's disappointment of ridiculous prices to get into the museum (it's free!)

Personalized tours – very rare! Seniors groups or clubs

Became apparent to visitors that the building is small so why would they need a personal tour → that's why they need the other attractions and relations

Walking distance to ferry and cable car

Transport is hard for Zealandia because they are up the hill and not close to much else

When the museum partners up it expands tours and transportation is difficult;

- Do you have records of how many people went on each tour – we already have the records for overall tour numbers.

Making a tour at specific times for the camera obscura exhibit could be hard because people may not want to go at that specific time

Crown Jewels exhibit they spent \$400/day spent \$10,000 because it was an opportunity to advertise = \$100,000 of publicity

Tours and talks are main focus because it's a free institution

b. Have you ever had a tour for a single exhibit?

Rugby exhibition: Hot on the Heels; Peter Bush famous sport photographer came as guest and you could come and have a chat with him → big name and still not many people came (present for couple of days)

Margaret Mahi – children's writer internationally: not that popular

Chinese talker: book launch – great day! 2 school groups, 60 ppl in vaca room and 80 on steps trying to get in → had to add an extra one

Raw NZ ballet – great turnout

**If you make camera obscura appealing to the right people such as groups of photographers or associate heroes in that field with it, it can be successful**

- Try to attract Massey university school of fine arts, Well Tech and high schools to exhibit
- Primary, middle and secondary (5-17 y.o) hard to attract; Secondary is hard to attract but primary is who they attract most
- They have a holiday program: people book and pay them
- June is their winter so visitors would go to museums more; October is good for museums also
- Hour or two on a specific day that would fit into the day
- Competition for space to hold them or a resource; dedicate a room for program – much cheaper than venue higher

- Ymca out of school programs – place they can come to; scavenger hunt and tour (30min each)
- Holiday programs for employees children

**4. Chris: Random question about pop ups, Paul told us you may know:**

- a. Do you have documentation we can use as a reference to create an evaluation of the camera obscura pop up?

**Evaluate media from exhibits – tick sheet have stated to come to a specific place – public programs**

**Museum of Wellington City & Sea Marketing**

**Marketing Survey**

Kia Ora,  
We are a group of third year university students from the United States and are conducting research on behalf of the Museum of Wellington City & Sea regarding museum marketing and promotion. It would greatly benefit us if you could take the time to complete our survey by answering the following set of questions. Thank you in advance for your time and contributions to the museum and our research.

Cheers,  
Theresa Renna, Zach Bormemann, Jesus Chung, and Catherine Knott

**1. Overall, how would you rate your visit to the Museum?**

Very Good  Good  
 Satisfactory  Poor  
 Very Poor

**2. Approximately how long did your visit to the Museum last?**

Less than 30 minutes  31 minutes -1 hour  
 1-2 hours  More than 2 hours

**3. Have you visited this Museum before?**

Yes  No

**4. How many times have you visited?**

Once  Twice  
 3 to 5 times  More than 5 times

**5. Who did you visit the Museum with today?**

On your own  With family  
 With friends  With a group

**6. Are you:**

Male  Female

**7. Age:**

Under 20 years  50-59 years  
 20-29 years  60-69 years  
 30-39 years  70 years and over  
 40-49 years  Prefer not to say

## Museum of Wellington City & Sea Marketing

### 8. Where do you live?

- |  |  |
|--|--|
| <input type="radio"/> Wellington City (Tawa south) | <input type="radio"/> Wellington Region (Hutt, Kapiti) |
| <input type="radio"/> Elsewhere in New Zealand     | <input type="radio"/> Australia                        |
| <input type="radio"/> UK and Ireland               | <input type="radio"/> Europe                           |
| <input type="radio"/> The Americas and Canada      | <input type="radio"/> Asia                             |
| <input type="radio"/> Other part of the world      |  |

### 9. Which of the following best describes your ethnicity?

- |   |   |
|---|---|
| <input type="radio"/> New Zealand European/Pakeha | <input type="radio"/> New Zealand Maori |
| <input type="radio"/> Pacific Islander            | <input type="radio"/> Asian             |
| <input type="radio"/> Other                       | <input type="radio"/> Prefer not to say |

### 10. Household income (before tax)

- |  |   |
|--|---|
| <input type="radio"/> Less than \$40,000 | <input type="radio"/> \$40,000-\$75,000 |
| <input type="radio"/> Over \$75,001      | <input type="radio"/> Prefer not to say |

### 11. Which of the following describes your employment status?

- |  |  |
|--|--|
| <input type="radio"/> Employed full-time     | <input type="radio"/> Employed part-time               |
| <input type="radio"/> Tertiary student       | <input type="radio"/> Primary/secondary school student |
| <input type="radio"/> Not in paid employment | <input type="radio"/> Retired                          |
| <input type="radio"/> Prefer not to say      |  |

### 12. Would you recommend this Museum?

- |                           |                          |
|---------------------------|--------------------------|
| <input type="radio"/> Yes | <input type="radio"/> No |
|---------------------------|--------------------------|

### 13. Please rate your daily interaction with each of the following media.

	Multiple times a day	Daily	A few times a week	Weekly	Monthly	Never
Newspaper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tripadvisor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Google	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Magazines	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Museum of Wellington City & Sea Marketing

**14. Please rate how much you rely on each of the following media as a source of information regarding activities to participate in. (Please specify where prompted)**

	Not at all				Very Strongly
Newspaper: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Television	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Radio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tripadvisor	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Google	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Facebook	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Website: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Magazine: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**15. How did you hear about the Museum? (Select all that apply)**

- Newspaper (please specify): \_\_\_\_\_
- Television
- Radio station (please specify): \_\_\_\_\_
- Facebook
- Museum website
- Google
- Tripadvisor
- Other website (please specify): \_\_\_\_\_
- Museum signage
- Museum brochure (location obtained): \_\_\_\_\_
- School visit
- Word of mouth
- Magazine (please specify): \_\_\_\_\_
- Other: \_\_\_\_\_

**16. What did you come to the Museum for today?**

- Maritime history/Wahine Gallery/Wellington History/Maori History
- Event (e.g. performance, talk)
- Guided Tour
- Recreation
- Corinnation Cafe
- Other: \_\_\_\_\_

## **Museum of Wellington City & Sea Marketing**

**Additional comments about Museum of Wellington City & Sea and its marketing and promotion:**

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## APPENDIX H: INTERVIEW WITH NICKI PAPWORTH

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### **Meeting Questions and Minutes**

**15 Jan 2013**

1. Do you have specific pieces that correlate to certain exhibits?
  - Yes have done it and will do it in the future
  - Black and fashion book printed; still in store
  - With books you worry about not getting the money back that you used to print them, but sometimes you get a profit
  - It is a fine balance
  - Specific exhibits you want to use books rather than tea towels or household merchandise
- a. Have those worked in the past?
  - Only have a few left so from the sale records it worked pretty well
  - Suses at city gallery → exhibitions changing all the time, so she has more experience for what works and what doesn't
2. What category of merchandise is most popular?
  - Books, clothing, dvds, home wears (oven mits...), jewelry, branded products (to city and sea or trust)
  - Ranking:
    1. New Zealand souvenirs (magnets and key rings)
    2. Jewelry and clothing
    3. Home wears, stationary, calendars
      - Have done branded stationary to specific exhibits but general NZ is best seller
- a. Records of sold numbers of different merchandise. GOT IT!
3. Which category do you gain the most revenue from?
  - NZ souvenirs because of volume sold not because of cost
  - Jewelry is most profitable because of price: 1700 In 2010, 4000 in 2011 November; 1800 for books
  - 52% margin for revenue
    - Book margin will be lower because retail price is what the publisher recommends instead of jacking the price
    - Cable car gets a huge influx so they have a much higher margin which is why they get more money and have a bigger mix of stock
    - Exhibit specific items would be different for City and Sea and Cable Car
      - City: shirt and book – higher valued merchandise (high/med stock)
      - Cable: key rings and other things that are low value (med/low stock)
4. We are working with the camera obscura, do you have any suggestions for merchandise relating to the exhibit.
  - BOOKS! Careful about what's in the book



- Beautiful pictures!
- City gallery modern pictures didn't work well - a lot of pictures and quotes.
- Calendars don't sell well people don't come here to get one – tourism people aren't usually getting calendars
- Stationary: Pen and pencil with picture of Wellington in background
  - Nice notebook and pen – how we want it portrayed
  - Don't want to bring down exhibit from bad stock
- She would consider 1 expensive piece
  - It might be low selling, but it can be sold after exhibit is over

**Make your own camera obscura kit for children; more advanced models to sell**

- Cruise ships increases sales
  - Higher sales on tourism days
  - People on tours will buy exhibit specific things
  - NZ locals would buy more specific merchandise also

## APPENDIX I: INTERVIEW WITH KARRYN BAUDET

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January 18, 2013

**Karryn Baudet:** In charge of Carter and Cable Car retail stores and health and safety building maintenance and operations of Carter Observatory.

- The Cable Car Museum has the biggest retail offering
- The material within the retail shop doesn't change very often
- The key rings and constructible paper models are examples of branded items that they sell.
- For Carter retailing there is a smaller offering and less branded material for sale.
- They are currently looking to change what is available in Carter to make it more profitable.
- Museum of Wellington is trying to add in some new branded material.
- You have to be able to get a low price point in order to sell any material.
- You don't have much risk with developing Camera Obscura related merchandise because it is going to be a fixed exhibition.
- The most important thing about trying to sell your product is knowing your client.
- For example, Karryn "hates" most of the product for sale in Cable Car, but that is what is going to sell to the high traffic numbers that come into the shop.
- Basically she is able to sell anything she puts into the shop at Cable Car.
- They had some product that they hadn't been able to move for about two years at Carter and they moved it over to Cable Car and it was sold out within a few weeks.
- She has a hard time keeping things in stock at Cable Car. Bottom-line, everything is able to sell at Cable Car.
- Baseline pricing for products is twice the price they bought it for plus GST is the lowest she is willing to sell anything for.
- In terms of Trust related merchandise, Cable Car sells the trust paper models.
- The point of branding is not for advertising but is rather to make and keep memories, so it isn't about just throwing a label on an item but relating it to an experience they could of had at the museum. Just putting label doesn't add anything.
- What category of merchandise is most popular?
  1. Jewelry, models, toys, clothing...
  2. Jewelry - \$120,000 sold per year
  3. There is a huge profit margin on the jewelry being sold.
  4. Another popular category is New Zealand related material.
  5. Clothing also does fairly well. At the Cable Car there are these jackets that each sell for \$350 and they are able to sell 40-50 of them every Cruise season (Oct-April).
- Which category do you gain the most revenue from?
  - o Jewelry, models, toys, clothing...
  - o Jewelry is definitely the most revenue gaining.
    1. The clothing at the cable car can be very expensive and have huge profit margin, but not as high as jewelry.

- We are working with the camera obscura, do you have any suggestions for merchandise relating to the exhibit.
- We are looking at retail for the final exhibit, but we are also doing a pop up camera obscura. Would there be any interest in us researching pop up related merchandise for the store?
  1. Try to make the paper products look old. The vintage or sepia look will do well. Something that has an old yellowed look would fit with the camera obscura and sell fairly well. Look for a pattern or something that can relate to the exhibit.
  2. Like the pattern on the ceiling in the library (where we were meeting), she has been trying to come up with the right pattern to put on that for a while.
  3. Also look into pinhole camera and other optical related products. They aren't specifically camera obscura, but they are related and would probably sell.
  4. Book? – You would want to do a small size of book because the larger books aren't selling as well. There is new researching coming out of Great Britain and Australia that is showing that large coffee table style books aren't doing as well and that smaller books are selling better. This is due to price point as well as being able to fit things into a suitcase and the weight of books. Smaller book would increase the overall number of books sold.
- You should talk to Zealandia because they produce guide books for their
- Don't do the catalogues. They don't work.
- Other information:
- Te Papa contact: Darren Gillies
- Museums of Victoria has great branded material

## APPENDIX J: INTERVIEW WITH A LOCAL HOSTEL MANAGER

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### Hostel Interview

People inquire for transportation because not many people have cars

- Recommend trains because they are the same length of time as a bus but they have prettier views and ppl can get up and walk around
- They are part of the BBH group which is connected to hostels around New Zealand

Wellington:

- Most people have no idea what to do when they get there
- Lord of the Rings and Hammonds
  1. Half or full day tours
  2. \$45-\$115 usually but some are up to \$150
- Safari tours of red rocks and seals
  1. Paid attraction
- Many people know about Te Papa already and she suggests going there
  1. 2-3 hours to spend there
  2. Most parts of museum are free
- City and Sea Ship 'n Chips tour is a big tour sold
- Zealandia
  1. Night tour because a lot of people want to see a kiwi
  2. Paid attraction
- Kayak tours along the water front, bike rentals and rock climbing
  1. Paid attraction
- Mount Victoria hike
  1. Free
  2. 45min long
- Parliament tour
  1. Free
- Cable Car
  1. Most people know about it already and ask for costs
- Older generation:
  1. Some only ask about museums
  2. City tour bookings because they have the money and don't want to walk
- Younger generation (backpackers):
  1. Beaches and walking around city
  2. Not many city tours because they want to save money and can walk everywhere
- Best-selling tour in Wellington = \$45 Lord of the Rings tour
  1. Recently people have been going for paid tours because they are getting more older couples and less backpackers staying there
  2. Haven't been telling people about Ship 'n Chips tour because she doesn't know enough about it to sell it
  3. Right Royal tour brochure isn't on display because she has no idea what it is

Hotel guests

- Anyone
  1. More than just backpackers
    - Most know it as the old Waterloo Hotel
    - They have private rooms
- Range from infants to 90s
- 50/50 national vs international visitors
  1. They are close to the ferries and they are in the city so business people come and stay or people that are just passing through
  2. National
    - Overnights won't look for tours
    - NZ travelers will ask for tours
- Off peak from April – July/September
  1. Quiet for regular visitors
  2. A lot of school groups
- School groups:
  1. Ask about tours – won't book them
  2. Usually go to Te Papa, Parliament and City & Sea
    - Free and walking around city

#### Advertising advice:

- Best way:
  1. Bulletin boards on first few floors of hostel
    - Post on there to get name out
  2. Brochures
  3. Having travel desks know about the tours
  4. Placing posters on other floors of hostel and
- Right Royal Tour and Ship 'n Chips
  1. Talk about it with the travel desk attendants
  2. Tell them what is included
  3. Make sure they know about it so they can sell it
  4. Offer free tours because it is a better marketing tool for Travel agents to be able to say they have done the tour and they like it
    - Has been offered but hasn't been planned yet
- Manager's opinions:
  1. Love brochures
  2. Would like A4 posters with large pictures and deals on it
  3. Write "book here" on poster so people know they can do it
  4. Less writing and more prices/deals
  5. Make specials at busy times of the years or talk to hostels/other places to make specials with them

## APPENDIX K: INTERVIEW WITH SELENA MURRAY

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Type of visitors that go to the I-site for information

- 90% Internationals
  - 6. 60% Australian
    - o 30% USA, UK, Germany
    - o 10% China, India, rest
- 10% New Zealanders

Visitors come with an idea or ask for things

- Cruise passengers want to see the most of WLG in the time they have
- Other tourists see WLG as a transit place to go somewhere else instead of seeing it
- Looking for a City tour/ Movie Tours
- Most of them ask for things to do.

Most popular tours

- Weta Cave – deters due to public transportation
  - 1. Sell them movie tours
- Cruise are told only about the Cable Car
- Visit port to try to educate cruise passengers about things to do
- Te Papa has a guide at the port to sell the museum
- I-site tells them the most about MOWCAS although Maritime vs. National Museum (Te Papa)

Looking for

- Free things to do for cruise ship passengers
- Varied depending on interest
- Biggest sales are LOTR/Welly Movie highlight/City Tours/Hop On-Hop Off

MOWCAS guided tour improvement?

- Be in the Hop on/Hop off tour
- Schedule the tours
- Possible Hannon tours
- Catherine at Zest
- Walk Wellington
- Have a tour that takes them for hours instead of just 5 mins.
- Marketing/spread the word more
- Pick up and drop off
- Incentives
  - 1. Café vouchers, discount in retail shop, etc

Hard to sell something that is free

- Ship 'n chips is easy because the ferry ride is paid for
- Cable Car/MOW costs \$25 for a \$7 ride (hard to sell)
- Conscious tourists about exchange rates
- Visitation vs. revenue
- Add Carter for tour
- Transportation might help although might be expensive if numbers are not met
- Weather dependent

Make something the best in WLG

- Amazing retail store for souvenirs
- Something special that attracts visitors

Tracking visitors

- Difficult to track visitors that go from I-site to Museum
- Brochure numbers but still difficult

Hop On-Hop Off problem

- 3 different busses called the same
- Creates confusion for pricing and naming
- John's Hop On Hop Off
  1. Only company in WLG
  2. 16-18 stops
- Cruise's Hop On Hop Off
  1. 5 stops (MOW, Te Papa, Courtney Place, Cuba Street, Cable Car)
- \$50 more expensive
- Cruise shuttle called hop on hop off
  1. NOT a tour
- Shuttle from and to the city

## APPENDIX L: RELEVANT TEACHER COMMENTS

Response	Topic
Kupe discussion and Maori legend video. Making paper boats at the end. Although it all was very well presented.	Craft project
the children really enjoyed the interactive displays as well as trying to figure out how the hologram worked. the lady that gave the presentation and guiding was excellent in her delivery and the children responded to her positively.	How it works
Cable car ride, and MoCaS visit hands on experience	Hands on
The stories about the harbour, laser stories and interactive time at exhibits.	Interactive
Scavenger hunt type questions to get the girls excited about looking around the museum. Hands on activities (comparing old photos & looking for connections).	Hands on
Wonderful stories about Wellington and Wellington Harbour. The interactive aspect of the museum. Fantastic 'shows'	Interactive
The opportunity for our students to have a look and interact with the exhibits - thanks for recognising that they needed this!	Interactive
The children loved the holographic myths and the interactive talk at the entrance.	Interactive
The range of teaching styles, hands on activities as well as static ones.	Hands on, Teaching styles
Storytelling, art, drama-use of three mediums in programme	Teaching styles
the experience of "senses" in the first room - turning the sounds off the carving and talking about personalities of characters and legends	Sensory
Students loved learning about Paddy and after watching the 3D story being told about how it is done.	How it works
Everything - too much to name. But particularly the variety of the programme, from the hands-on exhibits, the photo presentation, the holographic display, the chronological time-line exhibit and the detailed and interesting way that everything is presented.	How it works, Hands on
The class were allowed to share their knowledge and understanding of myths and legends when talking with Rachel. The wonderful craft activity. Independent exploration of the activities	Craft project, interactive
more interactive displays	Interactive
Purposes for around one of the areas where they looked around - perhaps a scavenger hunt or questions to answer	Hands on, Teaching styles
Maybe a number of short talks following directly by a "go and find" activity to consolidate what was said.	Hands on
Flexible timings possibly, treasure hunt, type discovery learning activity to keep younger students active and on the go.	Hands on
The students had to really look at the photographs and portraits to try and work out what was happening. There was a lot of thinking and a lot of talking in groups about what they were thinking, and what was going on.	Hands on, Teaching styles
interactive and well received by our students	Interactive
Fantastic experience for the children to be able to interact with artefacts. Guide had superb knowledge and had excellent relationships with children.	Interactive
It was incredibly informative, relevant to our class inquiry and lots variety and hands-on exhibits for the students to look at. Fantastic educator who was inspiring, interesting and knowledgeable.	Hands on



APPENDIX M: ZAK PHOTOGRAPHS FOR EXHIBITION

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Cable Car from Kelburn, Wellington



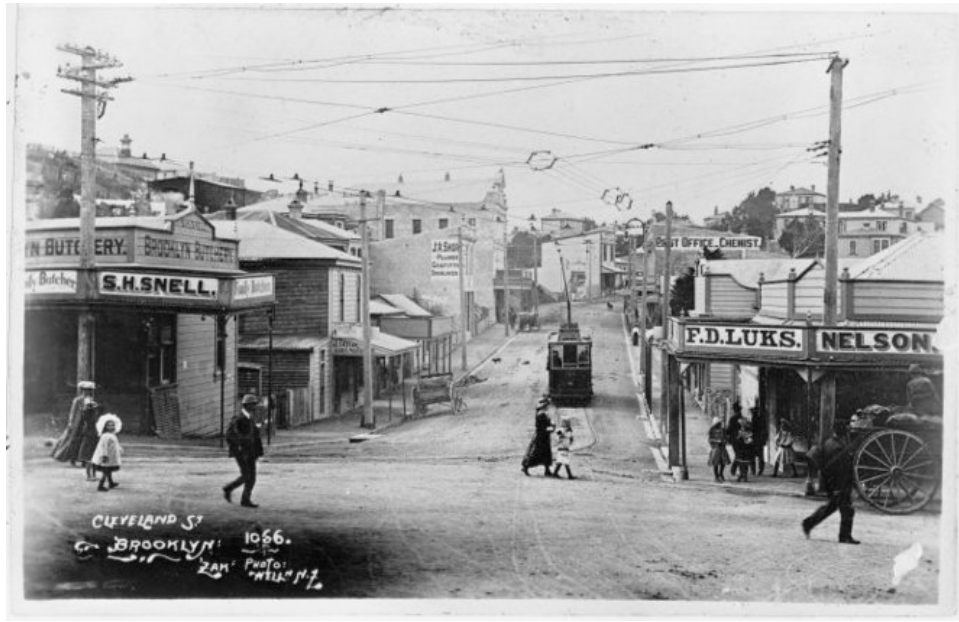
Lambton Quay, Wellington



Worser Bay, Seatoun, Wellington



Bank of New Zealand: Corner of Lambton Quay & Willis St, Wellington



Cleveland St, Brooklyn, Wellington

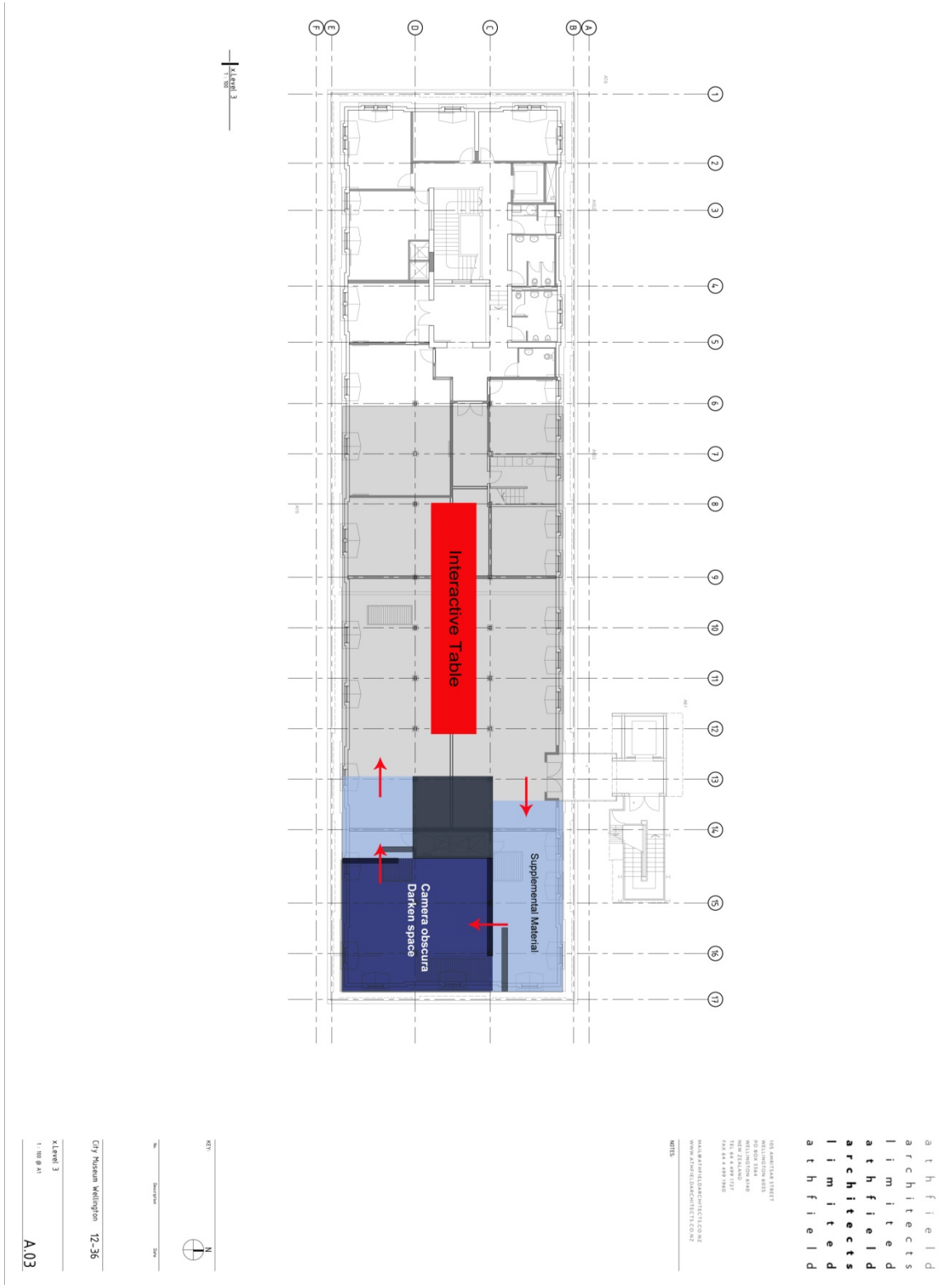


Government House, Wellington



Ohiro Rd, Brooklyn, Wellington

# APPENDIX N: FLOORPLAN OF EXHIBITION FLOOR





A relic from the Christchurch International Exhibition 1906-1907, the Camera Obscura became a great attraction at Days Bay. This Zak photograph above shows the camera obscura above the heads of those in the 'collar and tie' relay in 1908.

# Camera Obscura



Here is an inverted image of Jervois Quay seen from a camera obscura model built for the Museum of Wellington City & Sea.

Museum  
of Wellington  
City & Sea



# Camera Obscura

## Primary/intermediate

-please note that due to the material of this programme it is not available to students below Year 6

## Background to the Programme

The camera obscura is a new way of seeing Wellington in an ancient manner. The phenomenon can be created using a simple hole in a wall to project an inverted image of the outside world. Our camera obscura uses a series of lenses and mirrors to correct the image and allow you to interact with a real-time view of Wellington's city.

## Focus

The Camera Obscura programme involves critical thinking and reflection. It can be tailored to your focus. Options include: changes of Wellington, basic optics, reflecting on change.

## Programme overview

**Introduction:** in a brief conversation students discuss how the camera obscura works, how it produces an inverted image, and learn how their programme will run.

**Experience:** students will learn more about the optics behind the camera obscura through interactive displays and activities before entering into the camera obscura room. Group follow-up tasks are available depending on focus. The programme ends with students visiting the camera obscura exhibition and viewing the city in real-time.

**Reflection:** students are invited to reflect on the changes to Wellington over the past century through the panoramas and Zak's photograph. Students are encouraged to try sketching their own view from the camera obscura at the interactive activities table.

## Curriculum links

**Science:** The Physical World

**Technology:** Technological Knowledge

**Social Studies:** Continuity and Change

## Pre/post-visit activities

- **Research** the history of the camera obscura to discover its use in ancient times for astronomy and art
- **Visit** the Carter Observatory to see Wellington in a new way through the night sky and see the modern way of looking at the stars
- **Create** a pinhole camera see the phenomenon first hand

## Resources

### Print

Newspapers Records—Papers Past  
Edwardian Wellington: Photographs by Joseph Zachariah—*William Main*

### Digital

Timeframes

email  
[museumeducation@wmt.org.nz](mailto:museumeducation@wmt.org.nz)  
or phone 496 1945

[www.museumswellington.org.nz](http://www.museumswellington.org.nz)




Museums Wellington is a Wellington Museums Trust institution and receives major funding from Wellington City Council



Museum  
of Wellington  
City & Sea




*Tour Flyer*




**obscura Wellington tour**

Experience the **Museum of Wellington City & Sea's** camera obscura exhibition and its unique perspective of Wellington's history and changes.




+

Avoid the queues and take a return ride on the **Wellington Cable Car.**




+

Explore the **Carter Observatory** and enjoy a spectacular planetarium show.



**\$35 adults  
Tours every day  
Book by 10 am**

Booking  
T: 04 472 8904  
E: [museumtours@wmt.org.nz](mailto:museumtours@wmt.org.nz)  
or book at Wellington i-SITE



Museum of Wellington  
City & Sea 2



*A4 Poster*



## **obscura Wellington tour**



### **Includes:**

**Museum of Wellington City & Sea's** camera obscura exhibition

**Wellington Cable Car** priority return ride

**Carter Observatory** personal tour and planetarium show

**AND** receive a **15% off** voucher for the Museum's gift shop!!

**Only \$35! Book here.**

*Tour Signage*



**Have you seen Wellington upside down lately?**

**camera obscura exhibition**

**now open!**

**Museum of Wellington City & Sea  
on Queens Wharf**

