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An accessible adventure : a treasure hunt for students with special needs through the Monterey Bay Aquarium

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Running Head: An Accessible Adventure

An Accessible Adventure:

A treasure hunt for students with special needs through the
Monterey Bay Aquarium.

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Many students with special needs visit the Monterey Bay Aquarium every year. The students are always excited to be there, however, many teachers find a stressful and challenging experience. A tool has been created for teachers to help focus their students and promote inquiry, exploration, and inspiration which will greatly improve student learning. Resources are currently available to supplement teachers' programs, but they do not include considerations for students with special needs. A multisensory guide has been developed for students with disabilities with aid of a veteran special needs teacher. This guide will work to ensure a successful and fun learning experience for everyone at the Monterey Bay Aquarium.

Appendix:

Abstract.....Page 2

Appendix.....Page 3

Setting the Stage.....Page 4

Problem and Issue.....Page 5

Literature Review.....Page 7

Methodology.....Page 10

Results.....Page 12

Description and Justification of Action.....Page 19

ActionPage 20

Critical Reflection.....Page 28

Reference Page.....Page 30

Setting the Stage

“Wait! Everyone come back! Where are you going? We need to stay together!” Many chaperones have been heard saying this as students go running around the Monterey Bay Aquarium. Teachers spend months talking about the aquarium and getting their students prepared and excited about their upcoming visit. Most teachers send their students out onto the floor with a worksheet but unfortunately they tend to be outdated and ineffective. Students are also frequently running around the aquarium without direction or structured use of time, and there is only so much that a chaperone/teacher can do. I have seen many students approach an exhibit, “ooh and ahh”, and walk away. They may have seen something interesting but they didn’t truly engage with the exhibit and learn from it. They have an amazing opportunity to be at a fun, interactive, and educational institution, yet they aren’t able to utilize it to its full potential.

I have been a volunteer guide at the Monterey Bay Aquarium for eight years and I have watched many school groups go through, few are getting the full experience. I have also taken some classes through the Aquarium and found myself becoming the frantic chaperone, trying to engage my group as much as I can, but unable to do so without a guided activity from the teacher. I would love to see a resource for teachers that assists them in devising a worksheet/ treasure hunt for their students once they get to the Aquarium. This is why I am creating such an activity that helps teachers ensure that their students learn and engage at the aquarium, as well as incorporates state standards they have been following back in the classroom. Hopefully, the guide will allow teachers comfort in knowing their students are having an enriching and fun experience at the Aquarium.

Problem and Issue:

Teachers and students arrive at the Monterey Bay Aquarium excited to learn; however teachers struggle to ensure that their students engage, learn, and reflect on their experience. There is minimal information from teachers regarding their experience at the Monterey Bay Aquarium and how effective it was. So, I am relying on my 8 years of experience and what I have heard from teachers as the principle information on the problem. Once students get to the aquarium they are usually very excited and cannot wait to get off of the bus. When they do they run around stopping briefly at exhibits that catch their eye, but most of the time they do not truly connect with what they are seeing. Although their teachers have spent time preparing their students, when the students are in charge of walking themselves around the exhibits they may not necessarily be making the essential correlations back to classroom lessons. Some teachers have created guides for their students, a way of requiring them to answer questions about what they see. The only problem with this method is that most of the questions are either factually based (requiring little personal student input) or have no consistent theme (they are random questions that do not allow students to walk away with an understanding of the bigger picture). At present there are a few options as to what you can do with your students at the Aquarium. These options include: self-guided tours, ocean explorers (staff guided), and discovery lab explorations (staff guided)- (Monterey Bay Aquarium, 2008). The discovery lab is a small lab with animals, and it is specifically designed for students. However, they have limited availability and time. It also just takes you to one area and, you are NOT guided through the rest of the Aquarium. The ocean explorers takes you on a “behind the scenes” tour, you get to look at certain exhibits in depth with a knowledgeable staff member. This is great but the time slots are VERY limited and it is for specific grade levels and covers only some subjects. So, although the Aquarium has

addressed the issue of what happens once you get to the Aquarium, there is still a lack of guidance for students.

The goal of the Monterey Bay Aquarium is to “inspire conservation of the oceans” (Monterey Bay Aquarium, 2008) and I want to ensure that students who visit are able to become inspired by their visit. I want them to leave the Aquarium excited about all of the new things they have learned, and eager to help create a positive change in the oceans. Having spent so much time as a guide at the Aquarium I see how children love to learn about the interesting animals and habitats they have there. Students come to the Aquarium everyday and I want to ensure that they have a meaningful experience there. Creating a guide that makes them use their senses, personal experience, and intellect -will make their time at the Aquarium more effective.

Literature Review

Teachers know that working with special needs students presents some new and different considerations and issues than we may be ordinarily accustomed to. Finding a way to make meaningful connections between the students and their lives can be difficult, regardless of ability level. Sometimes making these connections is hard because every student has different abilities, and some students will connect with certain things and others will learn from something different. So making sure that everyone has a wonderful experience can be daunting. When working with special needs students teachers must always find inventive and fun ways to engage students, assist them in using present experiences that are available, and always be aware of in working with these exceptional students.

In reviewing the small amount of literature that is available discussing students with special needs and how to engage with them, I found none pertaining to engaging with these students at an aquarium. However, I did find some information with the Smithsonian Institute about their exhibits and the considerations that they make for people with special needs. Looking at that information and a handful of other pieces of information I found a few dominant trends. I also have included a few that I have noticed from the work that I have done with special needs students.

First, in creating an experience for any child we want to not just engage one of their senses, we need to involve as many as possible in order to immerse them (Anido, Personal Communication, 2008). This is especially important in ensuring a meaningful experience for special needs students. In creating a presentation for special needs students, the professionals at artmuseums.com suggest that people should: “Utilize all the senses in your presentation. Let students experience the ‘sound’ of an environmental installation piece, or the ‘feel and form’ of

sculpture. There are even artists who incorporate taste, as a "medium" into conceptual works”

(Art Teacher on the Net, 2007, n.pg.). Also, the Smithsonian Institute (n.d) says that:

“Multisensory presentations provide choices for the sensory channel used and interesting repetitions of key points. Some people, however, have difficulty sorting overlapping sights and sounds. Balance noisy and quiet areas within the exhibition and isolate sound through receivers or acoustic treatments” (n.pg.). In short, the best way to ensure a meaningful, effective, and fun experience for special needs students is to give them many different ways of exploring the place that they are in. Special needs students learn best when their senses are engaged and they use their abilities to help them learn and explore.

The second, is that students must be able to easily access things physically. As stated by the American Disabilities Act (2002): “alternative designs and technologies used will provide substantially equivalent or greater access to and usability of the facility” (ADA, 2002, n.pg.). If students are taken out of the classroom, the new place should be as easily utilized by the students as possible. Not being able to explore things in an uninhibited fashion frustrates the students and hinders the learning process. Special Needs students deserve an equal chance of experiencing things. For example, if you are working with a student who has a visual impairment the exhibit should have:

Objects mounted against complex backgrounds (e.g. a vessel mounted against an enlarged photograph of an archaeological dig) are difficult to see for people with low vision and for those with figure-ground perceptual problems.... Multiple objects staggered from the front to the back of a case may also cause visual clutter and foreground- background discrimination problems for some people (Smithsonian Institute, n.d.)

Ensuring that students are able to appropriately explore the area around them means that they will learn as the exhibit intends to and teach them.

Third, if students are not having fun they are not going to learn anything (Anido, Personal Communication, 2008)! Students learn better when they are enjoying themselves and exploring the world around them. In order to make students learn, teachers must: “Most of all create a fun and educational environment that children will want to return again” (Art Teacher on the Net, 2007, n.pg.). Ultimately, no matter what your ability level, learning comes more naturally when things are fun and engaging. When designing an experience for students it is vital to keep in mind that they want to have fun and learn in the process.

These themes lead me to believe that there is a need for students with disabilities to learn at the Monterey Bay Aquarium through a multidisciplinary, physically accessible, and fun guide through the Aquarium. Making sure to use their senses to the best of their ability and their sense of fun will make their visit more meaningful, effective, and memorable.

Methodology

Context. [Provide a bit more info...like Age or grade of students, type of special needs class, number of students in class] My project directly addressed the concerns of one particular classroom of special needs students that attend Blackford School in San Jose, California. The students are in 4th to 5th grades. The students range in abilities, physically and mentally. The teacher for that classroom, Leslie Anido, is an exemplary teacher and truly understands the needs of her students while ensuring that they have the best possible education towards helping them achieve more and more independence. Every year she works to incorporate a theme into her classroom and this year she is looking at water flow. She is showing her students where the water starts from in San Jose, the creek, where it flows to, Monterey, and the things that occur along the way. Every year she takes her students to the Monterey Bay Aquarium, and they spend time running around looking at the various exhibits. This project has worked to construct a guide/treasure hunt for her students once they make their way to the Aquarium.

Researcher. I have always been very active in ocean education, I have done over 1,500 hours of volunteer work with the ocean and children, 750 of those at the Monterey Bay Aquarium. I had the opportunity to go to the Aquarium with Leslie and her students a few times and it was a treat! I have been through there many times before but her students really saw things differently. They want to connect to the ocean and learn more about it. Leslie has been a close family friend of mine since I was born and she has graciously allowed me to help her in improving her students experience at the Aquarium.

Semi-Structured Interview. I had the opportunity to ask Leslie some questions with regards to her classroom and her students:

1. What do you see as the problem with ocean education; or What are you concerned about when it comes to ocean education?
2. What is currently being done to improve ocean awareness in your classroom? What is currently addressing ocean education in the State standards? And do you think this is good, bad, or indifferent? Why?
3. Do you feel the Aquarium helps your students improve their knowledge about the Monterey Bay Aquarium? What would help that process improve?
4. What do you think are the obstacles to teaching/ having a successful learning experience for your students at the Aquarium? What obstacles have you faced thus far?
5. What would you like to see in terms of the improvement of ocean education? Do you enjoy teaching this topic? Do you find it challenging? Why?

Procedures. The interview was conducted in my parents home in San Jose. It was informal and lasted for approximately one hour. We addressed the questions above as well as her students, their varying abilities, and other curriculum information.

Data Analysis. The data was collected with short hand notes. I also have since been in e-mail communications with Mrs. Anido and I have been following up on information pertaining to the guide as well as her students.

Results:

Over the past few months I have been talking to people about working with people of varying abilities at the Monterey Bay Aquarium. A few weeks ago I walked through the aquarium with a group of people with varying abilities and their comments along with those of the teacher I am working with have shaped the themes and concerns of my results. After interviewing Mrs. Anido I was in awe. I had initially gone into this project thinking that I could possibly re-vamp her curriculum with regards to ocean education. However, I found that her curriculum was fantastic and that it was better than anything I could have ever created. So, I had to rethink my idea and changed it to address the learning experience the students have once they reach the Aquarium. All of the other areas of her ocean teaching process seemed strong, fun, and effective. Mrs. Anido is giving me ideas for how to tailor this guide to her students special needs and their experience in the classroom. I am relying on my Environmental Science and Systems Policy minor and experience at the Monterey Bay Aquarium to dictate the scientific side of the guide. I have spent time in the Aquarium looking at the exhibits and finding ways to make students look at them, learn from them, and engage with them.

Here are the responses from the interview questions given to Mrs. Anido:

1. What do you see as the problem with ocean education; or what are you concerned about when it comes to ocean education?

Many individuals are talking about global warming and discussing the effects on the earth's surface and animals in the arctic regions, but little is being discussed about the changes in our local ocean and bay waters. This is because many teachers bring in current information from ready resources like newspapers and magazine and the arctic regional changes are more dramatic to most "lay people". The more current information that is made readily available to teachers, the

more is can be incorporated into the curriculum. This is why workshops, newsletters, etc. are so valuable. Another issue is having a connection to the ocean through local watersheds: creeks, streams, lakes, etc. When a teacher can personalize the experience or lesson, then it has much more meaning. Even though we live close to the beach, there are many students who have not been there. If we can connect them to the ocean through the local riparian environment, then ocean education might have more meaning. We are currently raising salmon and will put the fry in the San Lorenzo River. The students then have a connection to visualize when discussing the estuary and the ocean.

Having said that, the biggest problem with teaching science (or lack of science education) in the classrooms is that the state does not test it at each grade level so many schools or grade level so not make it a priority.

2. What is currently being done to improve ocean awareness in your classroom? What is currently addressing ocean education in the State standards? And do you think this is good, bad, or indifferent? Why?

I went back to look specifically for ocean education in the standards and there is very little specifically addressing this area. The ocean is studied at part of:

- the changing earth
- the water cycle
- the food chain
- ecosystems
- ecology

Also, social studies requires the students to know the oceans of the world.

Because my students are involved in the STEP program and the Monterey Bay Aquarium dive

program, we study the marine biome more than most classrooms. We incorporate the topic from very simple (repeated vocabulary stories like “In the Sea” and “On the Shore”) to reports on endangered species in this biome. We use the ocean to discuss basic science concepts as float and sink and study how marine mammals survive in the water using blubber gloves and ice water. We also take trips to local creeks for water testing to determine the health of our local creek and to make sure we are sending healthy water to the bay. 4th graders visit the Environmental Education Center to learn about the salt marshes and the relationship to the bay. We have gone on trips with the Marine Science Institute to learn first hand about the animals in the local bay waters. We have also participated in a field trip to the labs, museum and holding tanks in Santa Cruz.

I think it is especially important to educate Californians about our ocean waters. Our history is full of reference to the Pacific Ocean from Native Americans who depended on it to explorers who traveled over the waters to “discover” this area.

It is important to instill in my students that they are “stewards of the land, air and water”!

3. Do you feel the Aquarium helps your students improve their knowledge about the Monterey Bay Aquarium? What would help that process improve?

I feel very fortunate to qualify for a grant each year to get to the aquarium. Unfortunately, not all teachers can do that. The time and cost of travel is difficult to obtain. The Aquarium allows my students to touch, feel, and see ocean life and movement. The array of senses that can be used to enjoy and learn about the oceans is very extensive in the aquarium. The most powerful area of the aquarium for students is the “touch pools”. Many of my students will never go into ocean waters for a variety of reasons. This way they get to study, feel and experience the creatures that live in our local waters. This area allows them to put meaning to vocabulary they

have learned in class such as camouflage and adaptations. If the Aquarium could have a mobile unit that would come to schools to give talks and bring samples, then maybe more students would get a mini-experience” with sea life.

The Environmental Volunteers in Palo Alto do a Marine Science lesson that teaches about marine life, ocean depth, animal adaptations, etc. which is great, but it does not reach all students. Some students get meaning from touching, seeing and smelling the “real deal”.

4. What do you think are the obstacles to teaching/ having a successful learning experience for your students at the Aquarium? What obstacles have you faced thus far?

Time and money! The time to adequately teach the subject with all the specific curriculum materials mandated by school districts that must be used in a uniformed manner. When we use to create our own learning units we could integrate the subject knowledge we wanted to include in the unit, but now there are materials that must be covered to meet benchmarks set by the district. Since I teach special education, most of my students do not take the regular standardized test so I have more flexibility in integrating a theme into various subjects. This is why I get to do more on this subject than others.

The other major issue is money. I write grants to obtain science materials, schedule presentations at school, and to go on field trips. Not all teachers are comfortable or take the time to do this. The Valley Medical Center Foundation sponsors us for our diving experience each year. I pay for the bus through a grant. I also then need to pay for a few wheelchair accessible cabs to take students home after the trip if they do not have accessible transportation. This often costs me \$1600.00 for one trip to the Aquarium (and this is with no admission fee!).

However, once at the Aquarium, I have felt that my students get the full experience. Only some of the microscopes and pools are not accessible to them.

5. What would you like to see in terms of the improvement of ocean education? Do you enjoy teaching this topic? Do you find it challenging? Why?

There needs to be more accessible programs in two different ways.

1. There needs to be more hands-on education programs that can come to the schools outside of Monterey County or partnerships developed with marine science organization in other local communities to bring hands-on learning activities into classrooms.

2. There needs to be more accessible field trips on the shoreline and on the ocean. Many shorelines, tide pools, etc. are not accessible for individuals with mobility issues or the plant and animal life is protected so an individual with a visual impairment cannot “touch to learn” the ocean life.

I love teaching this topic. I grew up in So. Calif. so have been around the ocean all my life. There is always something to learn about the ocean. The ocean connects all of us together – there is nothing more powerful than that.

Basic concepts about the ocean can be taught in the classroom, but classroom lessons can never capture the essence of the ocean. Only through direct contact with the ocean, does one develop a personal connection with the water.

Even after snorkeling recently in Hawaii, I cannot find the right words to adequately describe in words my total experience. The challenge in teaching about the ocean is passing on my passion and respect for our ocean waters and all that it hold for our survival!

Some of the issues brought up in Mrs. Anido's interview I am not able to cover within this capstone. Money is a problem for special needs teachers but unfortunately I do not have enough time this semester to incorporate this into my project. From the interview with Mrs. Anido, my research, and my personal experience there were a few common themes that were carried across and should be considered in the creation of the guide.

Fun:

Listening to Leslie and talking to the people at the Aquarium I think this is key. In order to make students want to learn, you first have to ensure that they are having fun. The group that I walked with talked a lot about engagement and about how kids understand things in terms of fun. The more fun they have, the more they learn and the more they learn, the more they have fun! I watched the group and when they were laughing and chit chatting with each other, they were learning more. They were questioning things that they saw and engaging with the animals and environment.

Accessible:

Because the students have special needs their access to the Aquarium needs to be practical for them and encouraging them to explore. The ADA has worked to make sure that all places are accessible for people with disabilities. This does not just apply to places but to activities as well. The guide needs to be something that is of practical use for all students, regardless of ability.

Informative and Inspirational:

The Aquarium works to "inspire conservation of the oceans" (Monterey Bay Aquarium, 2008, n.pg.). In order to do this, the public must become informed. And in order to promote conservation there must be information.

Taking information and making it accessible and fun is the way that these students will learn and be changed. My sincerest hope is that these students will find something interesting about the ocean that will inspire them to protect it for life. The guide will push the students to actually stop and look at the exhibits as well as create a lasting fun experience!

Description and Justification of Action:

I chose to focus on students with disabilities because there are not enough present available resources regarding accessible education. After working with Leslie's class I was inspired to create something that would improve their engagement with the ocean. O Leslie's main concerns were for her students to be able to connect to the Aquarium using their varied abilities. Looking at what the students need (fun, connection to the classroom, and accessibility) I decided to create a sort of treasure hunt for them. This will be a fun way for the students to navigate through the Aquarium and actually stop to learn from the exhibits there. Normally students rush through the Aquarium and see "cool" things, but they fail to actually LEARN. The guide will require them to use different senses to learn about the animals and the ocean environment. It will be formatted in a manner which will be conducive to students with different abilities and sensory strengths, as well as connecting them to the natural environment.

Teachers who take their students to the Aquarium seek ways for their students to use their time there effectively. They struggle because they want their students to have a meaningful experience, but they do not have the time or sometimes the background to create this type of tool. This guide will not only do that it will encourage students to use their abilities to personalize their experience. My sincerest hope is that this guide will pave the way for creating other such learning tools for special needs students. There is a great need for accessible resources, I would love the guide to help students with disabilities learn and engage in a way that was not possible before. Given my experience at the Aquarium, the experience of Leslie, and the experience I have with special needs students, I know that I can create something that will be of value and make a difference.

Action:

This is the guide that was created for Mrs. Anido's students.

Monterey Bay Aquarium Scavenger Hunt

The first place you will visit is very tall and has lots of light. Look for a forest under the waves...

- Why is this area called the kelp forest? What makes it forest like?
- What are a few similarities you notice between the kelp and land plants/ trees?
- Like plants, what does kelp need to grow?
- Find a camouflaged animal and learn something cool about them!

Cool Facts:

- Kelp can grow up to 1 foot a day!
- All of the water in the Aquarium is pumped in straight from the ocean at about 2,000 gallons a minute!
- Look for a cool bright orange fish called the Garibaldi, it's the California state marine fish!
- This is the first exhibit that was built in the Aquarium.
- Kelp has little bulbs of air that allow it to float! This brings it closer to the surface and the sun so that it can grow!

Next you will not need to go far. You are in search for an animal that is like an ocean alien... (HINT: If you gave this animal a high-5 it would give you high-8)

octopus



- What do you think the suckers on their arms help them to?
- Why do they camouflage?
- Where are their mouths?
- What sense would you rely on if you were an octopus?

Cool Facts:

- Octopus are EXTREMELY smart! As smart as house cat!
- They can get into very small places! An eight foot octopus can squeeze into a hole six inches around!
- Some octopus like to hide in discarded bottles under the ocean!

Continue into the deeper ocean, you will need to find a place with the biggest sharks in the Aquarium!

shark



- Do you notice some fish staying at the top of the exhibit while others in the middle or bottom? What do you think this means? Does this effect what they eat?
- Find the skate egg case. Does this look like any other type of egg development you have seen? (Think cocka doodle doo!)

Cool Facts:

- There is rumor that there may be an octopus in the big exhibit!
- Those big sharks are actually not harmful! They are quite nice!
- There are a few Giant Sea Bass in the big exhibit and those are juveniles! The adults can get to be about 750 lbs and 150 years old!

Next, find a place that has animals that don't live under the water: instead of fins they have wings, and instead of scales they have feathers...

bird



- Why might some birds have long legs and others short? Why might some beaks be long and others not?
- If you were a bird, what adaptations would you need?
- Is it cold in this place? Warm? Windy? Is there an odor? What are your surroundings?
- What type of habitat is this? Does it look like any other place you have visited?

Cool Facts:

- Some birds look like they have one leg but they really just have it bunched up underneath them! They raise it to keep them warm!
- All of these birds were rescued!
- Some of the birds are surrogate parents for other chicks that are abandoned.
- Check out the fish in the pools, many of them are juveniles and this is where we raise them!

Now time for fun and to get your fingers wet!

sea star



- Touch a sea star, do different types feel different?
- Does the water feel different than you expected?
- Try touching kelp, how does it feel?
- Do you smell anything here? What do you think that is?
- Touch something you have never touched before!

Cool Facts:

- All of these animals are collected from the bay and returned shortly after!
- The deeper down you find a sea star in the ocean the softer it will be, the higher up the harder!
- If you touch a sea cucumber you will find that it feels like the inside of a roasted marshmallow!
- Kelp, although slimy is an ingredient in things you use everyday like ice cream, toothpaste, shampoo and yogurt! On the label it is called carrageenan.

Time to check out the tropics! There are penguins here as well as leafy sea dragons, and another fantastic touch pool!

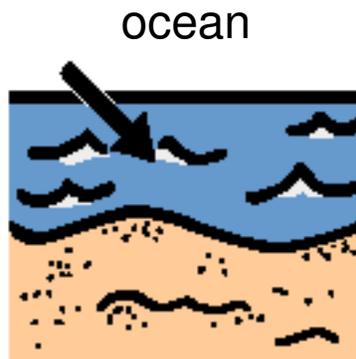
- Do you notice any differences between the warm water fish and the cold water fish?
- Check out the cuttlefish! Do they look like any other animals you have seen already?
- Check out the penguins!
- There is a great camera at the touch pool that will let you look at the animals up close!
- Try out the interactives that allow you to be a scuba diver!
- Do you see any animals that are hidden in the blades of the kelp?

- Look for sea slugs called nudibranchs, they are awesome and really colorful!

Cool Facts:

- *This is a brand new exhibit and there are all sorts of hidden games to play!*
- *Look underneath the touch pool, there are animals hidden down there.*
- *Every penguin has a name! If you look closely there is a name badge on their right wing. Each one has a name after a country in South Africa.*

Now, find a HUGE pool! (HINT: It's saltwater and outdoors.)



- Do you see any similarities between the things you have seen in the exhibits and the things you see outdoors?
- Do you see any animals?
- What do you think the brown goopy stuff on the surface is?
- What's the weather like today? How do you think that affects the ocean?

Cool Facts:

- Just off of the Aquarium deck is one of the deepest canyons in the world, Its just under the surface. It is the Monterey Canyon, and it can reach depths of twice that of the Grand Canyon!
- In the summers, the water here is colder and in the winter it is warmer. There is a wind that turns up the water in the summer and the cold deep water rises to the surface.

Next, back indoors to find the CUTEST, fuzziest creatures the Aquarium has to offer!

- Why do you think their fur is essential?
- Where do they live? Land? Sea? Underwater?
- Watch what they are doing, anything interesting?
- On the first floor by the gift shop there is a cart. There is an otter pelt so you can feel how incredible otter fur is. Feel free to ask the guide some questions and ask to look at some of the videos.

Cool Facts:

- Sea Otters have 1 million hairs per square inch!
- They spend 30% of their day sleeping, 30% eating, and 30% playing and grooming!
- They eat about 20% of their body weight per day!
- They dive to get their food in the wild, some of them carry a rock under their armpit that allows them to hammer off food they want!
- Some sea otters eat so many sea urchins that their teeth and bones turn purple!

A bit of a treck now, the next place is dark and vast...

fish



- Why is this area called the outer bay? Did you notice that this exhibit is darker than all of the rest? Does this tie into its name?
- What kinds of animals are you seeing here?

- Do you see any plants?

- Why do you think fish would school?

Cool Facts:

- The big window is over a foot thick! But, it has to be because it is holding back over a million gallons of water!
- This was the tank that had the first ever great white shark in captivity!
- The tuna here have been known to jump out of the water at feeding time!
- You are standing in front of the third largest window in the world!

Find a place that has a TV screen, a microscope and some very tiny creatures... (HINT: It's just behind the big exhibit.)

- What is plankton? Does it have to be small to be called plankton?

- What kinds of animals start out this way?

- Find one animal that has a cool lifecycle!

Cool Facts:

- The microscope at this station is incredible! It can show you things you cannot see with the naked eye!
- All of the plankton is collected in the Monterey Bay with a very small net.
- The Monterey Bay Aquarium cultures its own moon jellies, so the ones you see here may end up in a bigger exhibit someday!

You already saw the next cute creatures, however, these don't live in saltwater...

- When you enter the exhibit, touch the bronze otter statue. What do you feel there that you did not expect?

- What is different about these otters from the ones you saw earlier? Do they have different adaptations? Do they live differently?

Cool Facts:

- One of the adult otters had a baby and it is on exhibit with her!
- This is one of the newest exhibits in the Aquarium and there are lots of hidden treasures! (Look for the spitting fish...)
- Also look for the awesome moss frogs in the craft room!

Critical Reflection:

This project has been a true passion of my soul. I have always had a strong connection to the Monterey Bay Aquarium, and therefore a drive to spread their mission. I want every child who comes to the Aquarium to have an incredible experience. In my synthesis of the guide to achieve my goal I believe that there are some strengths and weaknesses. I think the strengths are: the marine biology information that is covered, the informal and fun way which it is covered, and the integration of the Aquarium's intent. Although I am extremely proud of the work that I have done there are some things that I feel are weak and deserve more time and attention: multisensory techniques and considerations of special needs. I have worked with Leslie's students before but I still feel that I do not know their individual needs enough to make the guide tailored to them. I would love to spend more time working on the guide and making it easier for them to use. I know that the questions are on paper, which makes it difficult for some students to respond to them. I also would like to find a way to make the guide more experiential than one dimensional. In the end, it is still a piece of paper, I would like to find a way to make it a kinesthetic experience. However, I do not know how to do that other than to walk through the Aquarium with them. This is one of the challenges I came up against and that if I could do it again, something I would spend more time researching. All things considered I am pleased with what I created and the next step is to give the guide to Leslie for distribution to her students at the Aquarium!

Walking around the Aquarium with people with special needs really opened my eyes. I loved just watching them learn and engage with the world around them. They saw things in a way I never even imagined. They made me feel so fulfilled and reinvigorated my passion for ocean education. I think this guide will allow other students to have a similar experience to those

that I walked around the Aquarium with. If students with special needs are given the opportunity to explore the Aquarium in a new way then the change that I hoped would occur, did. I wanted to get more people aware of special needs students and their incredible potential. I also wanted to get more people passionate about the ocean. This is not the only way to get special needs students involved, but hopefully it's a good start.

My capstone was inspired by my minor, marine biology (life sciences as stated in the MLO's). This is a section of education and of life that is struggling at the moment. I believe that the key to science education is getting people involved and hands-on with what is out there!

I focused on special needs students because there are limited resources present for them presently, this is an example of social justice. Social justice is working for education, equality, and representation of everyone. This guide will work to give special needs students a better experience than was previously available.

This also is critical communication, although it may not be verbal, it is asking students to communicate with their environment in a way that they may not have had before. Also, I have tried to incorporate different ways of communication outside of writing, such as looking, listening, and touching.

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