



Environmental Education

SANTA BARBARA SAILING CENTER

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Why Nature Connection?

Nature Connection makes children smarter, healthier and happier.

Background Information for Camp Counselors

Goals for campers:

- to develop a deep connection with the Ocean that is based on respect and appreciation, cultivated through observation, and grows by being challenged.
- to value teamwork and learn to work together towards a common goal
- to become self sufficient at kayaking, SUPing, Sailing, ocean swimming, surfing, handling marine life, and any other activities that come their way.

As a counselor, you are also a mentor. As a mentor, you must have two things:

- Knowledge of how to facilitate learning in an effective way
 - Effective here means that the campers become engaged citizens that have a connection with the natural world. This connection is fostered in order that campers will be motivated to work towards resolution of environmental issues.
- Background knowledge
 - of ecosystem services, ecosystems, local flora & fauna, and local & global environmental issues.

How to facilitate learning in an effective way

- We begin with connection to nature. We then focus on ecosystem services, and then consider both positive and negative human impacts. It is essential for the campers to connect with the natural world so that they can feel motivated to care for it in their daily lives, and work towards solutions.
- It is important to start with connection because Environmental Issues are complex, and can seem daunting. Since solving these issues is necessary, it helps to have an intrinsic interest in the natural world.

Age Appropriateness

The purpose of age appropriateness in teaching Environmental Education is to avoid subjecting younger children to overwhelming environmental issues such as the Great Pacific Garbage Patch and Mass Extinctions. The levels below are guidelines to follow to ensure that our campers are inspired and motivated rather than overwhelmed.

Level 1 *Experience connection* (all ages)

Outdoor unstructured free play. This is the most important level. Without this foundation, nothing can be built upon it.

Level 2 *Ecosystem Services* (9 and above)

How ecosystems benefit humans

Level 3 Human Impact (12* and above)

How humans interact with ecosystem services. Bring light to the issues associated with humans mishandling ecosystem services, and promote actions that preserve and protect ecosystems.

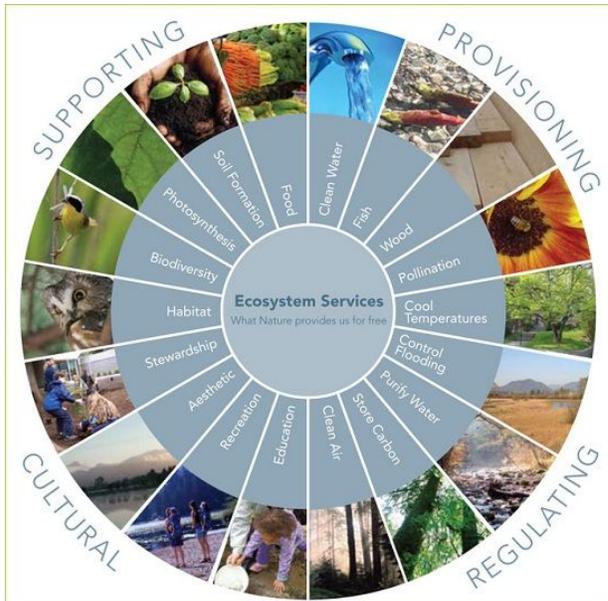
*It is ok to allow younger kids to participate in resolving issues, such as beach clean-ups and habitat restoration.

Level 1 Experience Connection

- **Timelessness** Allow kids to play without having to worry about time. You will secretly keep track, but it will feel timeless for them. If you see an opportunity for the campers to benefit from keeping track of time themselves, it is ok to stray from this exercise. You can ask campers to keep their watches at the dock if need be.
- **Set an example** by having pure fun. Get wet, and don't be afraid to talk like a pirate.
- **Awe and wonder** Be in awe of the beauty around you and anything that crosses your path. Inspire the campers by asking open ended questions that encourage curiosity. Ask questions such as, "I wonder...what do you think?" Verbally express your interest in the beauty around you so that the campers will begin to notice things they may not have noticed before. Also, encourage and validate campers by being awed by the things they point out or show you. Take the time to really enjoy what they show you.
- **Animal Identification** The primary goal is for campers to become familiar with the animals we see every day, and the secondary goal is for campers to be able to identify them on their own. A great way to encourage identification is to ask questions, find patterns (see the same species in the same area every day: a great way to do that is the bait dock and the dredge), point out/draw ID marks, allow for repetition, and encourage mimicry. (see "identification" in the pages to follow)
 - Counselors should become comfortable with identifying animals. Field guides and books will be available for campers to flip through during breaks.
- **Challenge** There is no greater joy than to watch a timid and scared camper become comfortable and excited about going in the ocean. This is where mentorship comes in. By watching you be comfortable in the ocean, they will become comfortable. Make sure to go at their own pace, yet challenge them to do what may frighten them. All the while, monitor their progress and remind them how far they've come from when they began. This will encourage and inspire them.
 - One camper has been coming to camp for many summers and weeks in a row, and I just recently found out that she didn't know what body surfing was, and she was afraid to go in the waves! We started by getting her used to the water, and she asked me to pick her up every time a wave came (the waves look a lot bigger from their height; make sure to get on their eye-level). I taught her how to push off the sand with her legs, and catch a wave (being comfortable up to my neck in ocean the whole time undoubtedly made her feel more comfortable). By the end of the week, she was body surfing like a pro, not wanting to get out of the ocean.

- Challenge them to see that seaweed is beautiful and vast in color varieties. Do this by being comfortable with seaweed, holding it up to the light to see the color better, and playing funny games with it, like pretending it's a hat or scarf.

Level 2 Ecosystem Services



- Ecosystem Services are ways that humans benefit from nature. There are countless ways we benefit from nature. Here, they have been classified into 4 main sections: Supporting, Provisioning, Regulating, and Cultural.
- How does the ocean serve us in these ways?
 - The ocean, specifically marine organisms, provide 70% of the oxygen we breathe¹
 - The ocean moderates temperatures
 - The ocean absorbs about half the carbon that humans emit into the atmosphere²
 - The ocean provides food, recreation, and peace of mind
- “Where does that come from?” and “How does the ocean nourish you?” are the main questions of this level, and through these questions we learn that we are entirely dependent on the Earth for life.
 - Food and water are great examples because they are our most basic need. They must come from a healthy environment, or else our health is negatively affected.
- Ask these questions throughout camp, and simply allow the campers to experience it themselves. The goal is for campers to have an appreciation for where everything comes from and experience the services the earth provides them with.

¹ National Geographic Society. Diana Nelson, B.S. Education, M.S. Aeronautics, Master Teacher K-12. 2011. <http://nationalgeographic.org/activity/save-the-plankton-breathe-freely/>

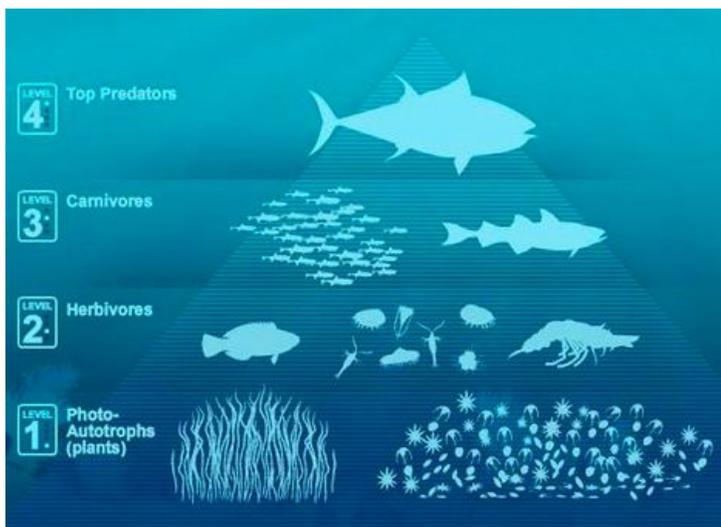
² National Geographic News. Pickrell, John. 2004. http://news.nationalgeographic.com/news/2004/07/0715_040715_oceancarbon.html

Level 3 Human Impact

- Human Impact: How the environment is affected by humans
- Be cautious with how you introduce level 3, make sure it is an issue that is within their *sphere of influence* (an issue they can work towards solving). The Great Pacific Garbage Patch and Global Warming are not good issues to bring up, unless you are only bringing it up to ages 12 and above.
- These issues come up all the time when we see pollution in the harbor. For some kids, it really burdens them to see these issues, so the focus should be on encouraging and helping them clean up and take care of the harbor. This includes using the debris net (located on the south side of the shop), having the marine mammal rescue hotline (805.567.1505) and the santa barbara wildlife care network (805.682.1080) in your phone, finding out as much information about the hurt animal as you can so you can report back to the kids, being concerned along with them, and not being hopeless about any sort of pollution or animal death. It is also important to have a healthy balance of caring for an injured animal, yet understanding that death is normal.
- Activity: “Everyone pick up 5 pieces of trash, please!” Have a container with you to carry the trash.

ECOSYSTEM DEFINITION

A biological community of interacting organisms and their physical environment. A complex network, an interconnected system.



Trophic Levels

The Lower levels are bigger because they have a larger population size. The higher levels have smaller boxes because they have a smaller population size to allow for a *balanced ecosystem*.

Energy Levels

Energy levels would be illustrated by an inverted pyramid, opposite of the trophic levels. The top predators get the largest box, and the producers get the smallest box. This is because the predators require the most energy, and the producers require the least energy. The energy for the top level comes from the energy of every level below it combined. The energy for the lowest level comes from the sun and atmosphere.

Balance and Imbalance in the ecosystem

Sea Otters + Sea urchins + Kelp + Climate

Sea otters eat Sea Urchins, which eat Kelp scraps.

In an ecosystem with no Sea Otters, Sea Urchins become overpopulated and they consume an excessive amount of kelp. This affects the climate because there is significantly less kelp to intake the CO₂ in the atmosphere. In an ecosystem with the right amount of Sea Otters, the Sea Urchin population decreases, and the Kelp begins growing back almost immediately.

Fun Fact: “The amount of CO₂ sequestered each year by North Pacific Kelp is equivalent to taking as many as 6 million passenger cars off the road” KQED

Here is a link to more information on this relationship. This website also gives suggestions of what questions to ask campers so they understand this concept.

Goal: to know that everything influences each other.

<http://ww2.kqed.org/quest/2014/02/25/balancing-act-otters-urchins-and-kelp/>

Get Familiar with Harbor Sea Life

Become comfortable with identifying animals and plants throughout the Santa Barbara Harbor to pass on the skill of observation, identification, and appreciation

Goals: Observation, Identification, Appreciation

Observation is a skill. You can help campers be better observers by asking them, “Woah, did you see that!?” anytime you see marine life. Take notice of everything around you: comment on the way the birds on the dredge are laughing “hey, they’re laughing at us!” Comment on the vast differences in color of seaweed, the barnacles and limpets on the pier pilings, etc. This will get them excited and help them be aware of their surroundings. If you continue this throughout the week, you will notice that they begin to point things out to you on their own; this is the goal achieved, encourage and reward them by being interested in what they want to show you!

Identification is another skill. Asking questions, repetition and mimicry are good ways to hone this skill.

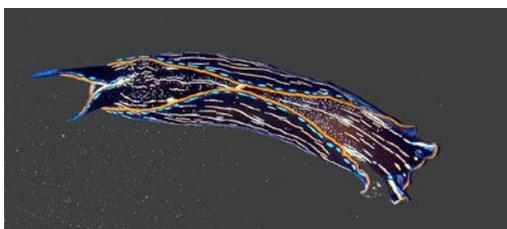
- Ask simple questions about the identification marks of an organism. “what colors did it have?” “What about that Great big bird over there? What kind of beak does it have, long or short? Neck, long or short? Color of feathers?...”

- Repetition is helpful for kids to learn and remember the names of animals. For example, The Great Blue Heron. “Claire, look at that Great big bird over there!” “What color is it? How long is its neck? Want to know his name?...Great, (because it’s HUGE) Blue (Because it’s BLUE) and Heron, because well, I don’t know..can you say Great Blue Heron? She will repeat it after you. Continue going by the bait dock, maybe next time she’ll say “hey, it’s our friend, what’s his name? Huge Blue heragon?” Eventually, with repetition, they will get it. Make sure to reward them with a high-five when you hear them get it right, and when they are close to getting it right.
- Mimicry helps campers build connections with the animals and become familiar with them, making it easier to identify them. For example, saying” AR AR AR” and flapping your hands together like a sea lion should be encouraged!
- Drawing Draw the shape of a bird in the sand and show the distinctive characteristics so that kids can identify them. For example, Terns (royal, elegant or caspian terns), have a forked tail and pointed wings. Terns join us every day at sandspit, and their calls become very familiar. These birds make themselves so obvious every day-make sure each camper is aware of their existence and would be able to identify them on their own.
- Tracking Look for footprints in the sand and ask questions about them such as, “what kind of bird made those? What was it doing? Was it a pelican?...go check their feet.....their feet are webbed, so it wasn’t them. Hmmm...what bird could it be, then? A Great Blue Heron?...what was it doing? Eating? How do you think it was walking? Slow or fast?” You can bring in mimicking how it was walking here.

Appreciation often comes naturally for the younger campers, but as adults, we need to let campers teach us this skill all over again. When they are enthusiastic and excited about a little crab that you’ve already seen 1,000 times, realize that they’ve probably seen it 1,000 times too and since their wonder is still there, yours can be, too. Make sure to be enthusiastic about little findings with them; you’ll see that they come up to you and say, “look what I’ve found!” Make sure to be consistently excited for them. If they find something and it’s out of sight but in walking distance, ask them to show you, or say yes when they ask you if they can show you. These are the important moments of wonder and awe that must be valued and encouraged.

Daily Attractions for Kayak/SUP camp

- Seals
- Sea Lions
- Crabs of all kinds (Hermit, Rock, Kelp...)
- Nudibranchs (Navanax, pictured below)



- Sea Stars
- Rays
- Octopuses
- Sea Snails of all kinds (Worm Snails, Moon Snail, Shark Eye snail, Tulip Snail)
- Sea Slugs (these guys camouflage really well, don't miss them, they're a sight to see!)
- Sea Anemones (find a sunburst anemone right off our dock)
- Mussels
- Clams
- Limpets
- Barnacles
- Kelp Flies
- Many fish*
- Sea Birds*
 - Pelicans
 - Cormorants
 - Tern Varieties
 - Egrets
 - Great Blue Herons
 - Sand Pipers
 - surf scooters
 - Loons
 - Grebes
 - Many more birds that I don't even know!

HANDLE WITH CARE*

teach kids how to respectfully handle sea life such as crabs, sea snails, limpets, and the occasional brown sea hare. (to handle vertebrates you need IACUC training and certification, so we don't handle them here unless advised to by wildlife care network). Before allowing anyone to handle marine life, have a talk with everyone so the rules are absolutely clear.

1. Use the Golden Rule: "Do unto others as you would have them do unto you"

- "That crab is in it's natural habitat, its home. Would you like it if you were safe and snug in your bed, then someone tore off your roof and grabbed you, carried you around, and plopped you somewhere else?"
- Only hold it for a short period of time. If you see it is starting to get stressed (there are different signs of stress for different sea life) then you are to stay calm and make moves to put it back.
 - i. Crabs will begin to squirm and try to pinch you to get out of your hand. Put them back rather than try to fight with them. They're trying to make it obvious they don't want to be held.

- ii. Sea Hares will ink, but try not to let it get to that point. It is important to hold them very gently and not squeeze them. If you do so, you can hold them for longer periods of time.
 - Always put it back in the general area you found it and place it where it would be comfortable: on a rock, in a crevice, etc.
- 2. The best thing to do is to observe the creature in their natural habitat, the second best thing to do is hold them carefully.**
- 3. Always make sure to return them carefully to where you got them.**
 - These rules may seem strict, but if we have anything short of this, we will be teaching them that disrespecting sea life is ok.

*CA Department of Fish and Wildlife requires a \$43 license in order for individuals over 18 years to handle invertebrates. We must purchase this yearly in order to keep the habitat here.

From the Fish & Game website: <https://www.wildlife.ca.gov/Licensing/Commercial/Descriptions>

Tidal Invertebrate \$43.00 Required for any person who takes mollusks, crustaceans, or other invertebrates for commercial purposes in any tidepool or tidal area, including tide flats or other areas between the high tidemark and 1,000 feet beyond the low tidemark. Commercial fisherman using powered equipment to take ghost shrimp must also possess a valid tidal invertebrate permit.

Common mistakes: dropping sea life from too high, handling one organism for extended periods of time, squeezing sea hares, grabbing crabs by the legs (hermit crabs should be handled with an open palm, this encourages them to come out of their shell)

Fun Games

1. “whoever finds the most sea life wins!” Go the long way throughout the harbor when it’s low tide, point out everything you see to the campers around you, so that they can practice being observant and identifying species.

PURPOSE: for campers to develop a habit and practice of being observant so that they can appreciate that the ocean holds a lot more wonder than first meets the eye, and to continue this practice throughout their lifetime. Kid’s are naturally very observant, and we want to encourage that here rather than stifle it.

- If they point out something to you, ask them to share what it looked like, (ask about: color, size, pinchers/ beak...) Again: be intrigued, excited and encouraging about what they found.
 - Make sure to be in no rush, and encourage going slowly- there is a lot of life to see, if you go too fast you could miss something really important! (Rays, Sea Stars, Big Crabs.. could be lurking right in front of their very eyes without them knowing!)
 - Once you reach sandspit, gather everyone into a circle to share what they found...kids are allowed to collect organisms for showing, handling gently and releasing them back to their home.
2. **“Treasure Chest” Make a Habitat/ Ecosystem**
Use a large plastic tupperware container (with holes drilled into the top) for the kids to collect treasures from the beach and to release before leaving sandspit.

- When I left them alone with it, they ended up collecting crabs, small fish, hermit crabs, etc. and they soon figured out the ecosystem interactions! They'd say, "these small fish eat the algae off the big crab, and the hermit crabs eat these big fish..."
 - It is of utmost importance to be stern about how to handle organisms. Refer to the handling section above. Mishandling organisms can cause disagreements and fights between friend groups that is unnecessary, and stress out or kill marine life.
 - I would suggest not handing out the container until midweek. The first couple days they can attempt to make a home for crabs with sand and rocks.
3. **Explore Stearns Wharf** Go under Stearns wharf in search of sea stars, barnacles, sea anemones, sea lions and seals, it makes the paddle much more intriguing. Take the time to go really close to the pilings and investigate limpets, mussels, barnacles, tiny sea snails, and crabs. Something such as a pier piling may seem mundane but it's actually teeming with life. Again: what is the rush? Allow campers to collect limpets and bring them back the the "habitat" attached to the dock.
 4. **Explore the Bait Dock** Paddle near the bait dock and admire sea lions, seals, cormorants, Seagulls, Great Blue Herons, Terns, the mussels on the buoy, etc.
 - Ask questions that cultivate curiosity at the bait dock. This is a really special place to visit and observe every day, because you can discover *patterns*: the Great Blue Heron is there almost every morning, the Seals are there nearly every afternoon, the Cormorants like to hang out on the rope, and what are they doing with their wings?...
 - Refer to the "Identification" section for what questions to ask to cultivate curiosity and ensure kids understand what they're seeing.
 - It's more important that they recognize patterns and connect with the animal than are able to identify it, so don't be harsh if they don't identify it by the end of the week. Keep it simple, light, enjoyable and most importantly, fun.
 5. **Tracking** Point out the shapes in the sand to campers and ask, "what do you think that is?" "Little Birdies!" "Ya, that's a whole lot of birds that were here before us, isn't it?" "What do you think they were doing...?" The conversation doesn't have to be long, but it gets them thinking and the goal is that they will notice things such as this on their own. We once found Great Blue Heron tracks.
 6. Some campers need a break from being so observant all the time. Play games like Ninja, Tag, teach them to surf, get comfortable swimming in waves, body surf, draw in the sand, play "Titanic", and other water games.

The Double Dolphin Jump

It is life-changing! Jumping into the deep ocean and not feeling the ground is a very unique experience, and gives campers a chance to overcome their fears of the ocean in a fun way, surrounded by friends and encouragement. They may not even realize they're overcoming a fear! This can set them up for a lifetime of challenging themselves, overcoming fears, and

feeling comfortable in the ocean. Some campers need to see a counselor do it in order to feel encouraged to do it themselves. You may not realize it, but you are a role models. They look up to you. When they see you doing something, they want to be doing what you're doing.

Additional Resources

Books and Field Guides available for camper's use during breaks

Books, Websites, Field Guides

- <http://www.marinebio.net/marinescience/seacrew.htm> (SBCC Marine Science Course)
- <http://msi.ucsb.edu/sites/msi.ucsb.edu/files/docs/education/FieldGuide.pdf>
- <https://www.sbnature.org/content/663/file/KidsBirdGuideMar2011.pdf>
- <https://www.amazon.com/Stokes-Beginners-Guide-Shorebirds-Donald/dp/0316816965>
- https://www.amazon.com/dp/0316816965/ref=rdr_ext_sb_pi_hist_1
- <http://oceana.org/marine-life/corals-and-other-invertebrates> (great online resource)

Important Phone Numbers

- Marine Mammal Rescue Hotline (805.567.1505),
- Santa Barbara Wildlife Care Network (805.682.1080)

Local Environmental Issues (human impact)

The current issues of the Santa Barbara Coastal Waters are

- Polluted runoff
- Agriculture
- Sewage
- Toxic Waste
- Past Oil Spills
- Harbor Pollution (we are not a federally designated no discharge zone)

Global Ocean Environmental Issues

- Ocean Acidification
- Pollution
- Overfishing
- Excessive carbon affects marine life