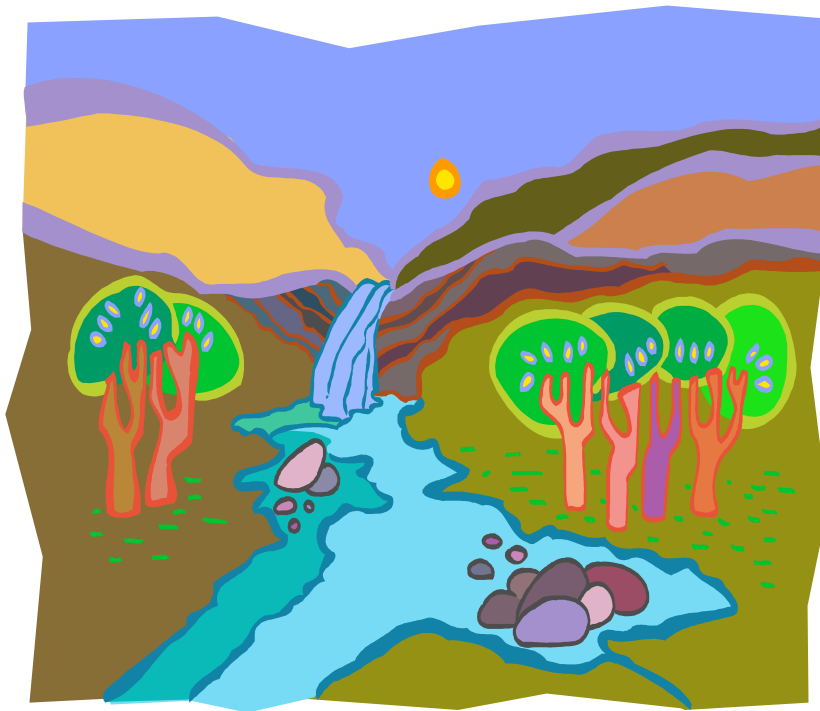




*Teacher Edition*  
**WATERSHED  
STEWARDS  
FUN BOOKLET**



Explore your watershed and help it stay clean for you and wildlife.



Printed on 100% post-consumer recycled paper

# Copyright of Materials



The following activities are being used with special permission for Watershed Stewards, an educational program for San Diego County students.

## How Much Water Does Your Household Use?

This is an activity adapted from *Waves, Wetlands and Watersheds: California Coastal Commission Science Activity Guide*, copyright 2003.

For original copies of this curriculum contact:

California Coastal Commission

45 Fremont Street, Suite 2000

San Francisco, CA, 94105

(415) 904-5400

[coast4u@coastal.ca.gov](mailto:coast4u@coastal.ca.gov)

or [www.coastforyou.org](http://www.coastforyou.org)

## The Life of a Sea Turtle

This is an activity written by Wild Coast non-profit organization, copyright 2003. For original copies of this curriculum contact: [www.wildcoast.net](http://www.wildcoast.net)



Supported by the  
California Coastal Commission's  
Whale Tail License Plate Grants Program



# TEACHER FUN BOOKLET

This booklet has all the activities instructions, background information, fun sheets, and answers you will need to guide your students as they work on the Watershed Stewards Project. There are Pre- and Post-Activities, Classroom Discovery Stations and instructions for the mentoring presentation to younger students by your class.



## BEFORE YOU BEGIN

Here are a few items that we ask you to complete before beginning the program.

1. Review the timeline below.
2. Confirm in-class activities location with coordinator.
3. Confirm in-class activity and field lesson activity dates with coordinator.
4. Assign research student pairs for program.
5. Teach and review Pre-Activity:  
How Much Water Does Your Household Use?
6. Be prepared to assist with the Discovery Stations (i.e. Sea turtle Game) by reading the materials in this booklet.
7. Assign student groups to present to first- and second-grade classes.

### WATERSHED STEWARDS TIMELINE 2006

February	March	April	May
Dr.Zoolittle Presents	Field Trip	Prepare for Presentations	Presentations
Discovery Stations			
Pre - surveys			



# LESSON PLANS



## ☉ PRE-ACTIVITIES

Teacher leads

How Much Water Does Your Household Use?*	PAGES 5 - 8
The Life of a Sea Turtle	PAGES 9 - 11
Build a Wetlands	PAGES 12 - 14

*\*Mandatory lesson before Discovery Stations*

## ☉ DISCOVERY STATIONS

Watershed Stewards Instructors lead

Introduction	PAGE 15
Rescue Wildlife	PAGES 16 - 22
The Life of a Sea Turtle	PAGES 23 - 29

## ☉ PRESENTATION

Teacher leads

Spread the Word	PAGES 30 - 32
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## ☉ POST-ACTIVITIES

Teacher leads

The Life of a Sea Turtle – Math Component	PAGES 33 - 35
How Much Water Does Your Household Use?	PAGES 36 - 38

## ☉ STUDENT SURVEY

Watershed Stewards Instructors lead

PAGES 39 - 40
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# PRE-ACTIVITIES

## HOW MUCH WATER DOES YOUR HOUSEHOLD USE?

**Challenge:** Students will monitor their households' weekly water usage.

**Background:** Water use is such an automatic and habitual daily activity that we often don't understand the consequences. Seldom do we connect the water that comes out of the faucet with its sources in the natural world. In between water's source and the sea, we divert water from its natural course for our uses. About 8 percent of total water use in the U.S. is for domestic use, 33 percent is for agricultural purposes, and 59 percent is for industrial/commercial uses. Each time we draw water from its natural setting or modify the natural journey of water, we are likely to have an impact on wildlife and habitats. For example, dams flood river and stream valleys, and draining wetlands removes water from natural wildlife nurseries.



**Materials:** Water Wise Tips sheet and Home Water Use Worksheet (Located in **Watershed Stewards Student Fun Booklet.**)

### Activity:

1. On a Friday (or any day), hand out the "Home Water Use Worksheet" to each student or refer to it in their Fun Booklets.
2. Review the Water Wise Tips.
3. Ask students to keep track of how much water is used in their homes for seven days, from Saturday to Friday. Students should post the sheet on their refrigerator and have each family member help by putting a mark in the section designated after each water use. The miscellaneous section is for special uses not listed (e.g. filling a fish tank, bathing the dog.) Students should bring in their results on Monday.



4. Have students total the number of gallons of water each of their families used in personal hygiene activities, home maintenance activities, and “other” activities.
5. On Monday, make a master chart on the board that summarizes total water use in the students’ homes for the seven days. Ask students what type of activity used the most water? The least?
6. Brainstorm places where water might be conserved. Challenge each student to reduce use and invite his or her family to also reduce water usage.

### Student Instructions:

- Read the **Water Wise Tips** on the next page with your class.
- Locate the **Home Water Use Worksheet** on the following page when instructed by your teacher.
- Keep track of how much water is used in your home for seven days, from Saturday to Friday. Post the sheet on your refrigerator and have each family member help by putting a mark in the section designated after each water use. The miscellaneous section is for special uses not listed (filling a fish tank, bathing the dog, etc). Bring in your results on Monday to share with the class.
- As a class, you will total the number of gallons of water each of your families used in personal hygiene activities, home maintenance activities, and “other” activities.
- Your class will then brainstorm places where water might be conserved.



# PRE-ACTIVITIES

## WATER WISE TIPS

**SHOWER:** Shorten your shower by five minutes and save **20 gallons** of water per day.

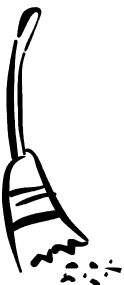


**BRUSHING YOUR TEETH:** Turn the faucet off when brushing your teeth and save **6 gallons** of water per day.

**BATHTUB:** Fill the bathtub only halfway, saving **20 gallons**.



**WATERING YOUR GARDEN:** Water just once per week, deeply, in the early morning to reduce evaporation. Encourage adults to plant native and drought-tolerant plants to reduce watering even further.



**CLEANING HOUSE:** Sweep rather than hose down around the outside of the house and save **150 gallons** of water.

**WASHING DISHES:** Run the dishwasher only when it is full and save **15 gallons** per day.

**WASHING CLOTHES:** Reduce the number of loads you do and save water by running the washer only when it is full.

**WASHING A CAR:** Encourage your family to take the car to a carwash that recycles water. This will save **40 gallons** of water and reduce water pollution!



# PRE-ACTIVITIES

## HOME WATER USE WORKSHEET

What It Takes	What You Do	How Many Times? (Place Tally Marks)	Total Gallons
3 gallons	Flushing the toilet		
3 gal. (water left running) 1 gal. (water turned off)	Brushing teeth		
5 gal. / min. (old showerhead) 2.5 gal. / min. (new showerhead)	Shower (Average shower length is _____ )		
40 gallons, If full	Taking a bath		
10 gallons	Running dishwasher		
40 gallons	Washing clothes		



# PRE-ACTIVITIES

## THE LIFE OF A SEA TURTLE

**Challenge:** Students will learn about the factors that affect sea turtle mortality (in preparation for the game during the Classroom Discovery Station).

**Background:** Sea turtles are an important part of the marine ecosystem. Conservation of sea turtles is necessary for these animals to continue their role in the environment and will allow us to study and appreciate them in the future. Eastern Pacific green sea turtles undertake a difficult journey to maturity. From the beach, to the open ocean to the coast, a variety of factors can affect the survival of sea turtles. Many Eastern Pacific green sea turtles lay their eggs on beaches in Michoacan, Mexico. The average clutch count (number of eggs laid) by Eastern Pacific green sea turtles in Michoacan is 67.8 eggs (Delgado-Trejo, 2002). Eggs will usually hatch after 6-13 weeks of incubation, depending on the temperature (Miller, 1997). Usually, the incubation period decreases as incubation temperatures increase (Ackerman, 1997). On average, 86% of hatchlings from each nest successfully hatch in Michoacan (Delgado-Trejo, 2002). After hatching, the baby sea turtles crawl to the ocean and swim until they reach a current. In the open ocean, or pelagic zone, they will hide and feed among patches of floating giant kelp (Nichols et al., 2001). As the young sea turtles grow larger (35-40 cm long) they will move to inshore, coastal areas (Nichols et al., 2001; Seminoff et al., 2002). They will remain in these coastal waters to feed until they mature (from 9-20 years) (Seminoff et al., 2002). Upon maturity, adult females will return to the beaches where they hatched to lay their own eggs. From the time they leave the nest, turtles are exposed to many threats. They may get lost, or die naturally from disease, exhaustion, and predators. However, humans pose the biggest threat to sea turtles. On land, human threats include egg harvesting, beach lighting and development, pollution, vehicles, sea walls, and beach compaction. In the water, human threats include direct turtle harvesting for food, bycatch (in nets and longlines), boat collisions, plastic entanglement

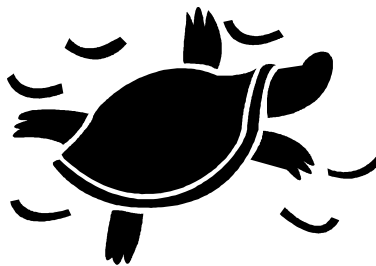


and ingestion, and habitat degradation (including pollution). These human threats lower survivorship estimates even further.

**Materials:** research materials, background information on sea turtles, Student Fun Booklet (including: Glossary List, Sea Turtles Quick Facts sheet, Species Information sheet), Pacific Green Sea Turtle Color-in

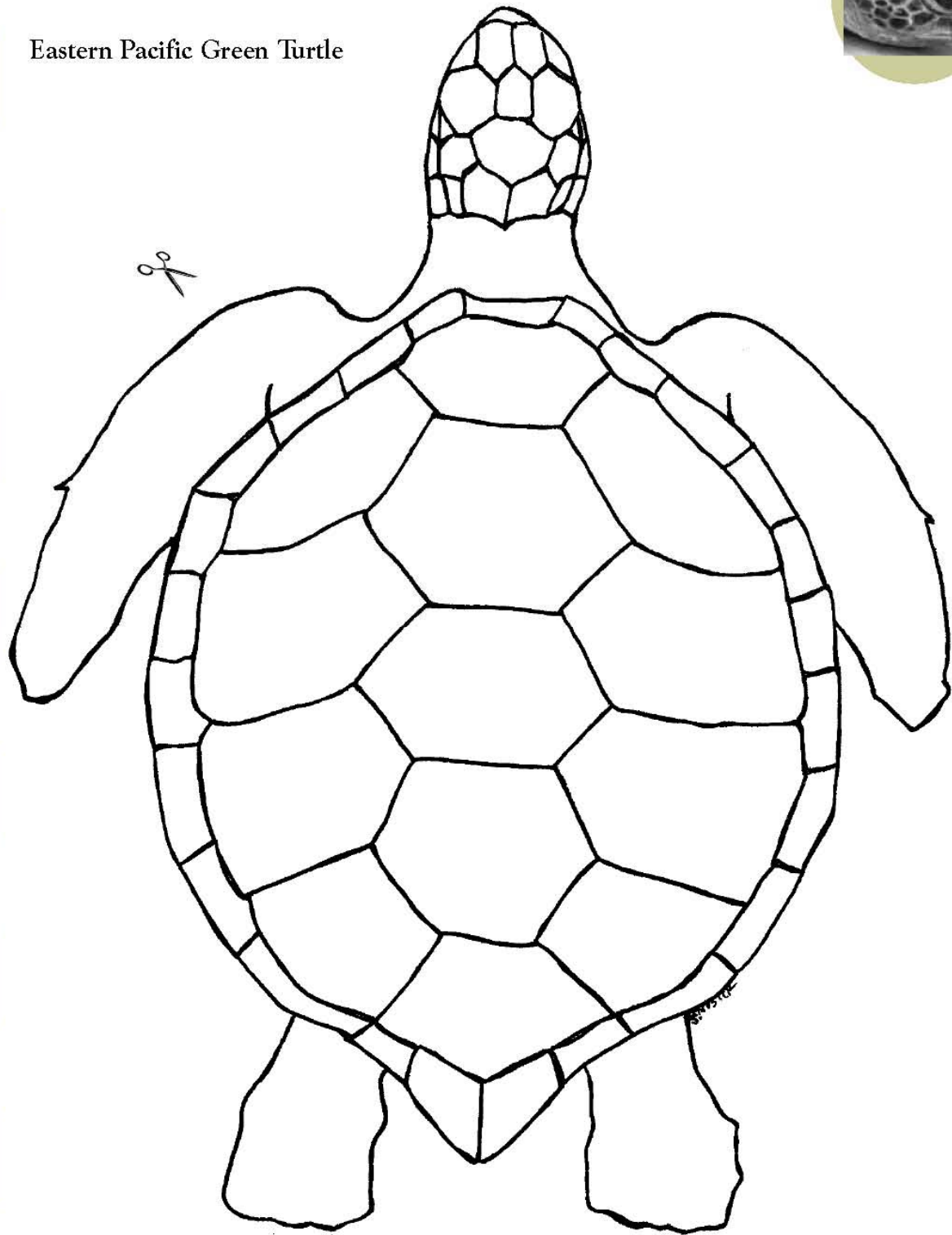
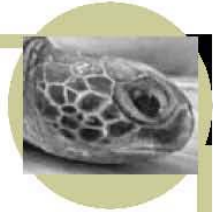
**Activity:**

1. Have students study the glossary list and read the Sea Turtles Quick Facts and Species Information sheets.
2. Have students use research materials and the internet to learn more about sea turtles.
3. Have students color in a Pacific Green Sea Turtle (see the following page).
4. Assign students a number from 1 – 56.
5. These turtles will be used during the Discovery Station Activity: The Life of a Sea Turtle.



VIDA DE LA TORTUGA

Eastern Pacific Green Turtle



# PRE-ACTIVITIES

## BUILD A WETLAND

**Challenge:** Students will learn what makes a wetland, and create a model that demonstrates the buffering and filtering effects of wetlands.



**Background:** Most of California's wetlands have already disappeared from the landscape, and only now are we beginning to see the consequences and realize the importance of this previously overlooked habitat. Wetlands serve critical biological and physical functions.

Biological functions of wetlands include: serving as habitat for bird and fish species (both migratory and year-round species); providing recreation, flood protection, water quality maintenance, and food for humans; acting as nurseries for 75-90 percent of all fish and shellfish harvested in America. (This natural resource account for \$111 billion in sales and provides one and a half million jobs.)

Physical and hydrological functions of wetlands include: flood control in low-lying areas (wetlands act as protective natural sponges by capturing, storing, and slowly releasing water over a longer period of time); dissipating wave energy as storm buffers along the coast; reducing erosions through wetland plant roots that hold soil in place; collecting water to recharge aquifers; improving water quality by trapping, precipitating, and recycling waterborne constituents from run-off; contributing oxygen.

Because of the unique factors that create wetlands over time, a balance is created of soil, moisture, and plants. Once wetlands are permanently drained, the conditions that created such productive soils are lost, along with their benefits, and once a wetland is altered, this balance is difficult to restore.

**Materials:** modeling clay, long shallow pan, scraps of indoor/outdoor carpeting, florist's foam, sponges, ½-gallon plastic milk jug with lid (make into a sprinkler by punching holes in an



upper corner), cup of soil, jar of muddy water, Monopoly “hotels” or other small object to be “houses”

### Activity:

1. What is a wetland? Have you ever been to one? Are they large or small? How can you tell if someplace is a wetland? Discuss the features of a wetland using the given materials. (Clay is the watershed, the carpeting or sponge is the wetland, the catch basin is the ocean or other body of water at the end of the watershed.)
2. Spread a layer of modeling clay in half of the pan to represent land. Leave the other half empty to represent ocean or lake.
3. Shape the clay in the pan to gradually slope down to the water. Smooth the clay along the sides of the pan to seal the edges. Make meandering streams in the clay that lead to the body of water.
4. Cut indoor/outdoor carpet, sponge, or florist’s foam to fill the space across the pan along the edge of the clay. This represents a wetland buffer between dry land and open water. This must fit well—the model won’t work if there are large spaces under the wetland or between it and the sides of the pan.
5. If we make it “rain” on the watershed before we put in the wetland, what will happen to the rainwater? Fit the piece of carpeting or sponge into the wetland area, and—using the milk jug sprinkler—sprinkle some “rain” on the land. What happens? Did the wetland absorb some of the water?
6. What will happen if the wetland is removed? Remove the carpeting and pour out the water. Pour the same amount of water on the model at the same spot and at the same rate as before. What happens?
7. If a wetland is filled in and houses are built on the fill, what might happen to the houses during a severe rainstorm? Why? Pour the water from the last demonstration out of the model and squeeze out and replace the piece of carpeting. Add “houses” to the model and make it “rain” again. What happens?



8. Pour out the water and squeeze out/replace the carpeting again. Spread soil over the clay. What will happen to the bare soil when it rains? “Rain” on the soil or pour muddy water from the jar onto the land. This water represents polluted runoff and sediment from the watershed. Compare the water that ends up in the body of water with the water in the jar. What happens?
9. Remove the carpeting, pour out the basin, and try the last experiment one more time. What happens without the wetland in place? Why did all the dirt particles end up in the body of water this time? How might muddy water affect fish or other animals and plants? How might all of this affect your life?



# DISCOVERY STATIONS

**Introduction:** Facilitator will discuss the Home Water Use Worksheet results and suggest tips for wise water use and conservation (using Water Wise poster).

**Stations:** Stations will consist of interactive activities and challenges. Students will rotate every 30 minutes between the two stations.

## RESCUE WILDLIFE

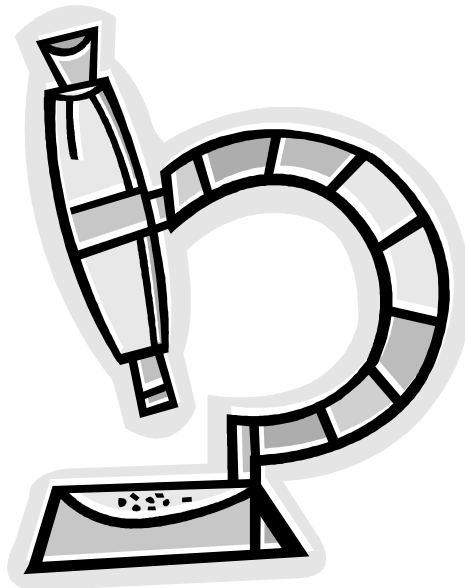
Students will visit displays and answer challenge questions on marine wildlife conservation issues.

## TRACKING SEA TURTLES

Students will learn about an endangered species and how humans can threaten and help them.

## Wrap-up:

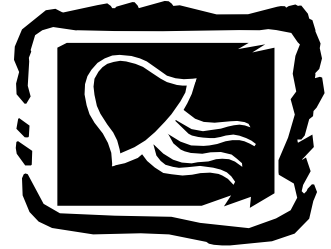
Facilitator will ask students for solutions to the **Rescue Wildlife** challenges, discuss the other discovery stations and hand out backpack tags.



# DISCOVERY STATIONS

## RESCUE WILDLIFE JELLIES

**Instructions:** With your partner, review the **Rescue Wildlife: Jellies** information and solve the following challenge. Use the clues provided at the Station. Then connect the dots below to uncover a sea animal that needs your help.

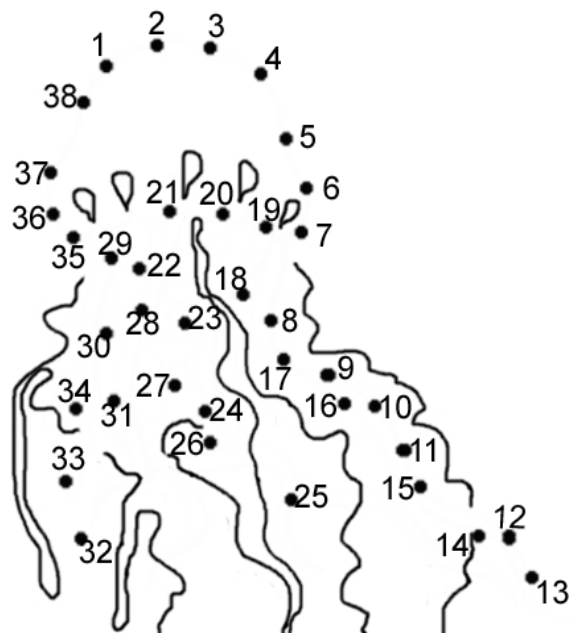


**Challenge:** Plastic bags and other pollutants enter the ocean through our storm drains. Plastic bags are one of the reasons all five sea turtle species in the United States are endangered. Many sea turtles have been found dead after eating a plastic bag, mistaking it for a jelly, their favorite food.

**What can you do to protect jelly habitat (and, therefore, sea turtles too)?**

### Your Solution

*Pack a waste-free lunch. Last year, over 30,000 plastic bags were collected off the beaches of California. A waste-free lunch contains reusable containers, utensils, and napkins. It eliminates the use of disposable packaging, such as plastic bags, juice boxes, paper napkins, and disposable utensils that end up in our watersheds.*



# DISCOVERY STATIONS

## RESCUE WILDLIFE CALIFORNIA SEA LIONS

**Instructions:** With your partner, review the **Rescue Wildlife: California Sea Lions** information and solve the following challenge. Then, review what you learned by solving the sea lion clues on the following page.

### Challenge:

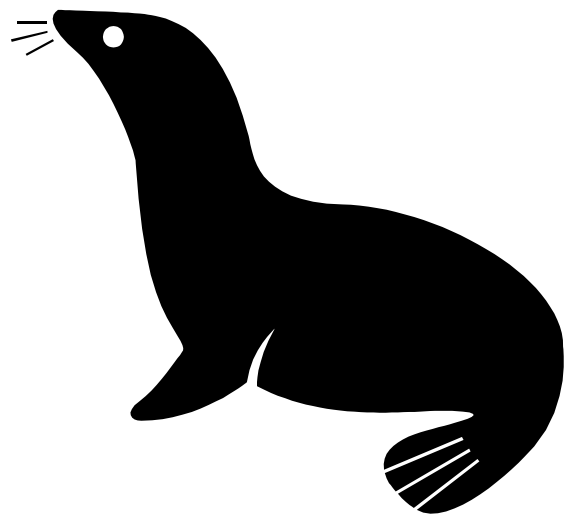
Over 100,000 marine mammals, like the California sea lion, are killed each year from trash. Items such as plastic six-pack rings, plastic bags, rope and

fishing line entangle these animals causing them to choke or drown.

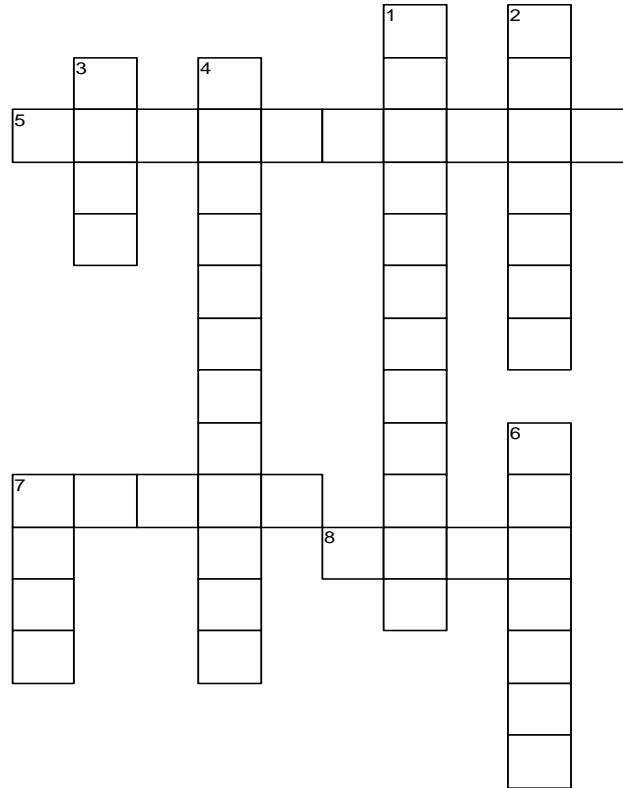
**What can you do to protect marine mammals like the California sea lion?**

### Your Solution

*Pick up trash and recycle, and help save marine mammals like the California sea lion. Marine mammals die each year from litter. 90 percent of the litter in the ocean is plastic that can be recycled. Help your watershed and wildlife by picking up trash and recycling. Volunteer for a community or beach clean up day and spread the word to your friends.*



# CALIFORNIA SEA LIONS CROSSWORD PUZZLE



www.CrosswordWeaver.com

## ACROSS

- 5 The state where these sea lions live
- 7 One of the sea lion's favorite foods
- 8 A group of sea lions

## DOWN

- 1 a sea lion is this type of animal
- 2 Sea lions use this body part to absorb heat
- 3 How sea lions communicate with each other
- 4 These can get caught around a sea lion's neck
- 6 Another favorite food of the sea lion
- 7 Sea lions like to do this

**Across:** 5. California, 7. squid, 8. raft **Down:** 1. marine mammal, 2. flipper, 3. bark, 4. six pack rings, 6. octopus, 7. swim



# DISCOVERY STATIONS

## RESCUE WILDLIFE BLACK-NECKED STILTS

**Instructions:** With your partner, review the **Rescue Wildlife: Black-necked Stilts** information and solve the following challenge. Then, help the shorebird below find its way through the maze to the Salton Sea.

### Challenge:

As wetlands are lost, shorebirds travel to inland areas such as the Salton Sea in California to feed. As Southern Californians use more water, the water from the Salton Sea is being soaked up. The Salton Sea is becoming saltier and therefore less food is available for the more than 4 million shorebirds that visit it each year.

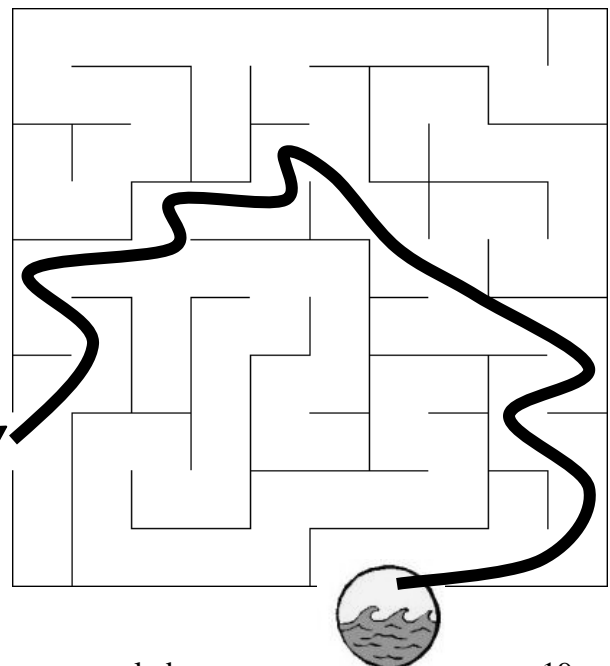
**What can you do to protect shorebirds like the black-necked stilt?**

Help the shorebird find its way to the Salton Sea.



### Your Solution

*Turn off the faucet each time you brush your teeth, and help save shorebirds like the black-necked stilt. You can save 6 gallons of water a day if you turn off the water when brushing. The more water we use, the more water is taken from the Salton Sea where over 4 million shorebirds visit each year to feed on fish and other salty dishes. Using less water will help save this area and the birds that feed on it.*



# DISCOVERY STATIONS

## RESCUE WILDLIFE BROWN PELICANS

**Instructions:** With your partner, review the **Rescue Wildlife: Brown Pelicans** information and solve the following challenge. Then, find the words on the next page in the word search. Look for the Hidden Message in the unused letters (left to right, top to bottom).

### **Problem:**

Pelicans nest, feed and rest near the shore where humans play and fish. Humans can walk and ride over their nesting sites, destroying pelican nests. Also, many people fish unsafely leaving fishing lines and hooks behind along the coastline.

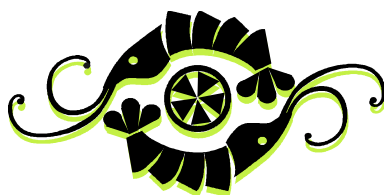
**What can you do to protect coastal animals like the brown pelican?**



### **Your Solution**

*Be careful where you play on the shoreline and save brown pelican nesting sites. Ask people who fish to properly dispose of their fishing lines and hooks instead of leaving them behind.*





## PELICANS WORD SEARCH

S E A V E W N A T E  
S R R A N E D H L E  
N L P O S W I A R L  
O N D T H L T I E F  
L A F E P S P B T H  
L C L I A X L N A O  
A I L O S R B G W O  
G L C L D H X V X K  
X E B R O W N J N S  
M P T H G I S E Y E

[www.WordSearchMaker.com](http://www.WordSearchMaker.com)

brown

gallons

shore

coastal

hooks

water

eyesight

nest

fish

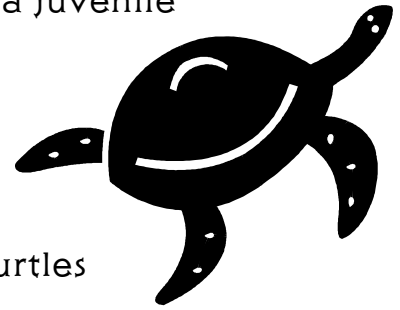
pelican



# DISCOVERY STATIONS

## THE LIFE OF A SEA TURTLE

**Instructions:** In this game, you will pretend to be a juvenile Eastern Pacific green sea turtle in Baja California, Mexico.



1. Take a look at the **Sea Turtle Quick Facts** (pg. 11).
2. You will receive 5 - 6 Eastern Pacific green sea turtles from the table to track during the game.
3. Turn the sea turtles over and notice the number on the back of each sea turtle. Hold the turtles in your hands with the numbers up.
4. The goal for the game is to see which sea turtle will live the longest. Listen for your numbers as the station leader calls out all numbers.
5. When your number is called, this means that your sea turtle died.
6. Place your sea turtle upside down in front of the threat sign that caused your death.
7. Discuss and review the Sea Turtle Questions with Station leader.



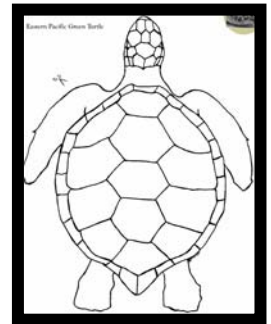
# DISCOVERY STATIONS

## THE LIFE OF A SEA TURTLE

### Sea Turtle Quick Facts

#### BIOLOGY

- Sea turtles are large, air-breathing reptiles. They are not fish.
- Sea turtle shells consist of an upper section (the carapace) and a lower section (the plastron). Hard scales (scutes) cover the shell (except for leatherbacks).
- In the Pacific Ocean, sea turtles are found from Japan to Hawaii and along the coast of North and Central America. Leatherbacks extend north to British Columbia.
- Sea turtles feed in shallow waters (except leatherbacks-they feed in the open ocean).
- Adult sea turtles migrate from feeding grounds to mating grounds. Most nest in the tropics (except loggerheads-they nest in temperate areas).
- Only mature females return to shore to lay their eggs. Males rarely return to land after hatching.



#### LIFE CYCLE

- A clutch of 60-170 eggs, resembling ping pong balls, incubate for 6-13 weeks in the sand.
- Hatchlings come out of the nest and head toward the brightest horizon (usually the moon).
- A “swimming frenzy” occurs as the hatchlings enter the water and head toward the open ocean.
- As small juveniles, sea turtles hide in huge mats of floating seaweed in the open ocean.
- Older juveniles join adults in coastal feeding or mating grounds, except leatherbacks which remain pelagic (in the open ocean).
- Mature females return to the beach where they hatched to breed and lay their own clutch eggs.



# Sea Turtle Quick Facts Continued

- They will nest 2-3 times in a season, but generally nest only every other year.
- Most sea turtles don't reproduce (reach maturity) until they are 9 -20 or more years old. Their life span may be more than 50 years.



## PACIFIC SEA TURTLE SPECIES

All sea turtles are federally protected by law in Mexico.

### **GREEN (*Chelonia mydas*)**

#### **Tortuga Negra**

**Size:** 110 cm (3.57 ft), 130 kg (286 lbs)

**Diet:** Primarily herbivorous

**Description:** Dark gray/black mottled with gray/cream plastron. Hatchlings black, white beneath. Nest in Michoacan and Islas Revillagigedo, Mexico and Galapagos Islands, Ecuador. Found in bays & coastal waters. Endangered (US).

### **HAWKSBILL (*Eretmochelys imbricata*)**

#### **Tortuga Carey**

**Size:** 90 cm (2.92 ft), 100 kg (220 lbs)

**Diet:** Sponges & benthic invertebrates

**Description:** Overlapping scutes, curved beak. Carapace has brown and yellow speckled pattern. Plastron white, dark markings. Hatchlings dark brown. Nest in Nayarit, Mexico. Few nesting beaches remain. Endangered (US).



# PACIFIC SEA TURTLE SPECIES

## CONTINUED

### LEATHERBACK (*Dermochelys coriacea*)

#### Tortuga Laúd

**Size:** 165 cm (5.34 ft), 400 kg (880 lbs)

**Diet:** Jellyfish

**Description:** Seven prominent ridges, smooth skin. Black with white spots, pink blotches on head. Hatchlings black, with white undersides. Nest in Baja California Sur, Michoacan & Oaxaca, Mexico and Costa Rica. Typically pelagic. Endangered (US).

### LOGGERHEAD (*Caretta caretta*)

#### Tortuga Amarilla

**Size:** 90 cm (2.92 ft), 100 kg (220 lbs)

**Diet:** Pelagic red crabs, jellyfish

**Description:** Large head. Orange-brown with yellow plastron. Hatchlings brown. Nest in Japan & Australia, not in Eastern Pacific. Common near Baja California. Threatened (US).

### OLIVE RIDLEY (*Lepidochelys olivacea*)

#### Tortuga Golfina

**Size:** 80 cm (2.59 ft), 60 kg (132 lbs)

**Diet:** Pelagic red crab

**Description:** Gray-olive with cream/white plastron. Hatchlings solid gray. Nest from Baja California Sur to Central America. Nest in large groups called "arribadas." Most common species in Eastern Pacific. Threatened (US).



# GLOSSARY

- benthic** - occurring at the bottom of a body of water
- bycatch** - organisms unintentionally caught while fishing
- carapace** - the top of a turtle shell, an outgrowth of bone
- clutch** - a nest of eggs
- cold stunning** - mortal shock from below-normal body temperature
- endangered** - in danger of extinction
- extinct** - no longer existing
- foraging ground** - the place where an animal eats
- habitat** - the place where a plant or animal naturally grows and lives
- herbivorous** - feeds on plants
- longline** - a heavy fishing line that may be several miles long and that has baited hooks in series
- maturity** - the age at which an animal is fully developed and able to reproduce
- mortality** - the number of deaths in a given time or place
- pelagic** - living or occurring in the open sea
- plastron** - the bottom of a sea turtle shell
- poaching** - to take animals illegally
- predation** - the killing and consuming of animals
- scute** - an external bony plate (part of a turtle shell)
- temperate** - having a moderate climate
- threatened** - likely to become endangered in the foreseeable future
- trawl** - a large conical net dragged along the sea bottom gathering fish or other marine life
- tropics** - a region or climate that is frost-free with high temperatures



# DISCOVERY STATIONS

## THE LIFE OF A SEA TURTLE WORKSHEET

### YEAR ONE

Year one begins with 56 juvenile sea turtles moving into the Bahia de Los Angeles area of Baja California, Mexico.



### YEAR TWO

56 sea turtles - \_\_\_\_ sea turtles that survive = \_\_\_\_?\_\_\_\_ sea turtles die

### YEAR THREE

33 sea turtles - \_\_\_\_ sea turtles that survive = \_\_\_\_?\_\_\_\_ sea turtles die

### YEAR FOUR

19 sea turtles - \_\_\_\_ sea turtles that survive = \_\_\_\_?\_\_\_\_ sea turtles die

### YEAR FIVE

11 sea turtles - \_\_\_\_ sea turtles that survive = \_\_\_\_?\_\_\_\_ sea turtles die

### YEAR SIX

6 sea turtles - \_\_\_\_ sea turtles that survive = \_\_\_\_?\_\_\_\_ sea turtles die

### YEAR SEVEN

4 sea turtles - \_\_\_\_ sea turtles that survive = \_\_\_\_?\_\_\_\_ sea turtles die

### YEAR EIGHT

2 sea turtles - \_\_\_\_ sea turtle that survives = \_\_\_\_?\_\_\_\_ sea turtle dies



# SEA TURTLE QUESTIONS

1. If all of the sea turtles are dead after 9 years, how many survived to maturity? What will happen to Eastern Pacific sea green turtles in Baja California if they can't survive to maturity? Will they become extinct?

*None of the sea turtles will survive to maturity because the earliest estimated age that Eastern Pacific green sea turtles reach maturity is 10. The population of sea turtles will get so small they will not be able to breed and they may go extinct.*

2. Count how many sea turtles died from each threat. Then, rank the threats and list the most common threat (the threat that killed the most sea turtles).

1. Netting
2. Shrimp trawl
3. Longline
4. Harpoon
5. Predation
6. Disease
7. Boat collision
8. Plastics
9. Cold stunning

3. If disease, cold stunning and predation are the only natural threats to turtles, what would happen if we removed all of the human threats?

*The sea turtles would be more likely to survive to reach maturity. The sea turtles would be less likely to go extinct.*

4. List two ways you can help sea turtles.

- *Learn more about ocean wildlife and sea turtles.*
- *Teach your friends and family about sea turtles.*
- *Respect wild animals.*
- *Keep our oceans clean. Keep plastics and other trash out of our oceans and streams.*



## DISCUSSION

More than 35,000 endangered sea turtles are killed each year in Baja's waters by poachers and as fisheries bycatch. Through the recruitment of local community members such as fishermen for research, education and monitoring projects, WiLDCOAST is leading a successful campaign to ensure that the sea turtle population has a chance to recover. WiLDCOAST's research projects include the study of sea turtle mortality rates, juvenile and adult sea turtle distribution, and sea turtle tracking studies. In addition to these research efforts, sea turtles can be conserved by fishermen who use TEDs (turtle-excluder devices). A TED is a special attachment to a trawl net that allows sea turtles to escape from the net while keeping the fish inside. Today, the younger generation of Baja residents support sea turtle conservation and educate their peers and elders about the importance of sea turtles. Keeping in mind these research and conservation efforts, wrap up the activity with a review of all the contributing factors that determine whether or not a sea turtle will survive to maturity. Discuss how humans threaten sea turtles and how humans can help sea turtles. Discuss the importance of researching, protecting and conserving threatened and endangered marine species. Discuss how poaching, bycatch, pollution, and other human activities contribute to the decline of sea turtles and how research can help us to avoid capturing sea turtles.



# PRESENTATION

## SPREAD THE WORD

### Make a Sign: Save a Sea Turtle

**Challenge:** Eastern Pacific green sea turtles need your students help. Currently the species is endangered. Your students will use their creativity to make signs that convey messages to other students about how they can help protect the green sea turtles.



#### Introduction:

- Eastern Pacific green sea turtles undertake a difficult journey to maturity. From the beach, to the open ocean to the coast, a lot of things challenge the survival of sea turtles.
- Many Eastern Pacific green sea turtles lay their eggs on beaches in Michoacan, Mexico. The average clutch count (number of eggs laid) by Eastern Pacific green sea turtles in Michoacan is 67 eggs. Eggs will usually hatch after 6-13 weeks.
- After hatching, the baby sea turtles crawl to the ocean and swim until they reach a current. In the open ocean, they will hide and feed on floating giant kelp. As the young sea turtles grow larger they will move to inshore, coastal areas. They will remain in these coastal waters to feed until they mature (from 9-20 years).
- Upon maturity, adult females will return to the beaches where they hatched to lay their own eggs.
- From the time they leave the nest, sea turtles face many threats. They may get lost, or die naturally from disease, exhaustion, and predators.
- Humans pose the biggest threat to sea turtles. On land, human threats include egg harvesting, beach lighting and development, pollution, vehicles, sea walls, and beach compaction. In the



water, human threats include fishing nets, boat collisions, and plastic entanglement and ingestion.

### **Teaching Objective**

Using materials provided as well as some art supplies, students will create signs that convey messages to the public that help protect Eastern Pacific green sea turtles. Each poster should include an image and a message (for very creative students, the image can be the message). Messages can be instructional (don't fish haphazardly), inspirational (you can help save our local sea turtle), congratulatory (thank you for recycling plastic and saving sea turtles), etc. Students can work as individuals or in teams.

### **Materials Needed:**

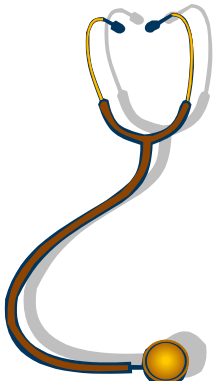
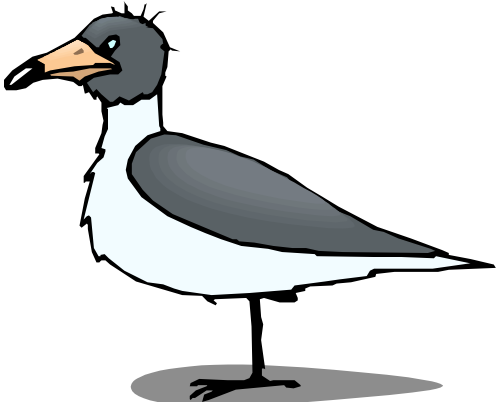
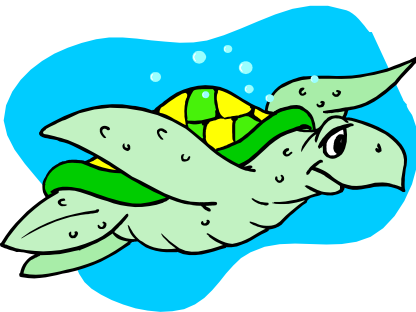
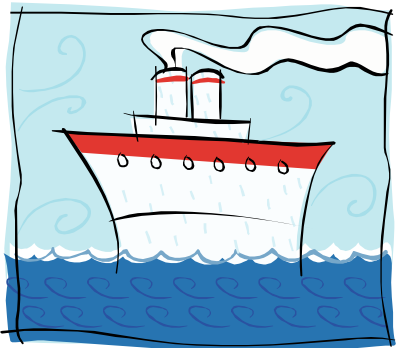
Copies of Clip-Art master (see next page)  
Scissors and glue for cutting and pasting  
Colored pens, colored pencils, and/or crayons  
Large piece of paper for the sign  
Other art materials for decoration

### **Instructions:**

- Review the Sea Turtle Quick Facts from the Life of a Sea Turtle discovery station lesson.
- Provide materials and suggestions for making signs to students and use the provided clipart.
- Have students visit a younger class in the school and share their sign with the students through a ten minute presentation.



# SEA TURTLE SIGN CLIP ART



# POST-ACTIVITIES

## THE LIFE OF A SEA TURTLE MATH COMPONENT

### Instructions:

Provide students with the number of sea turtles that survive after each year and ask them to multiply it by 58% (.58) to determine how many survived the following year.

### Survivorship Key

#### YEAR ONE

Year One begins with 56 juvenile sea turtles moving into the Bahia de los Angeles area.

#### YEAR TWO

Each year 58% of these juvenile sea turtles will survive.

56 (sea turtles from Year One)  $\times$  .58 (percent that survive each year) =

33 (sea turtles that survive)

56 turtles

-33 sea turtles that survive

23 sea turtles die

*Mortality factors (causes of death) and sea turtle numbers:*

1 netting

16 netting

38 disease

5 longline

17 predation

40 harpoon

7 disease

24 harpoon

43 boat strike

9 harpoon

26 netting

46 longline

10 predation

29 plastics

47 netting

11 netting

31 netting

51 longline

13 shrimp trawl

32 boat strike

55 boat strike

14 harpoon

37 netting



#### YEAR THREE

33 sea turtles (from Year 2)  $\times$  .58 (percent that survive each year) =

19.14 ~ 19 (sea turtles that survive)



33 sea turtles  
- 19 sea turtles that survive  
14 sea turtles die

*Mortality factors (causes of death) and sea turtle numbers:*

3 shrimp trawl	18 shrimp trawl	44 shrimp trawl
4 harpoon	19 boat strike	48 predation
6 netting	22 disease	54 predation
12 disease	27 cold stunning	56 longline
15 longline	35 cold stunning	

#### YEAR FOUR

19 sea turtles (from Year 3)  $\times .58$  (percent that survive each year) =  
11.02~ 11 (sea turtles that survive)

19 sea turtles  
- 11 sea turtles that survive  
8 sea turtles die

*Mortality factors (causes of death) and sea turtle numbers:*

23 shrimp trawl	34 harpoon	42 netting
28 shrimp trawl	36 predation	50 harpoon
30 longline	41 longline	

#### YEAR FIVE

11 sea turtles (from Year 4)  $\times .58$  (percent that survive each year) = 6.38~  
6 (sea turtles that survive)

11 sea turtles  
- 6 sea turtles that survive  
5 sea turtles die

*Mortality factors (causes of death) and sea turtle numbers:*

20 plastics  
21 netting  
25 longline  
39 shrimp trawl  
49 shrimp trawl

## YEAR SIX

6 sea turtles (from Year 5  $\times .58$  (percent that survive each year) = 3.48~  
4 (sea turtles that survive)

6 sea turtles

- 4 sea turtles that survive

2 sea turtles die

*Mortality factors (causes of death) and sea turtle numbers:*

2 predation

33 shrimp trawl

## YEAR SEVEN

4 sea turtles (from Year 6)  $\times .58$  (percent that survive each year) = 2.32 ~  
2 (sea turtles that survive)

4 sea turtles

- 2 sea turtles that survive

2 sea turtles die

*Mortality factors (causes of death) and sea turtle numbers:*

8 shrimp trawl

52 netting

## YEAR EIGHT

2 sea turtles (from Year 7)  $\times .58$  (percent that survive each year) = 1.16 ~ 1  
(sea turtle that survives)

2 sea turtles

- 1 sea turtle that survives

1 sea turtle dies

*Mortality factor (cause of death) and sea turtle number:*

45 plastics

## YEAR NINE

The sea turtle that lives the longest is # **53**. This sea turtle dies from disease at the end of Year 9.

*Mortality factor (cause of death) and sea turtle number:*

53 disease



# POST-ACTIVITIES

## HOW MUCH WATER DOES YOUR HOUSEHOLD USE?

**Challenge:** You will monitor your household's weekly water usage again after completing the Watershed Stewards program.

### Instructions:

7. Read the **Water Wise Tips** on the next page with your class.
8. Locate the **Home Water Use Worksheet** on the following page when instructed by your teacher.
9. Keep track of how much water is used in your home for seven days, from Saturday to Friday. Post the sheet on your refrigerator and have each family member help by putting a mark in the section designated after each water use. The miscellaneous section is for special uses not listed (e.g. filling a fish tank, bathing the dog). Bring in your results on Monday to share with the class.
10. As a class, you will total the number of gallons of water each of your families used in personal hygiene activities, home maintenance activities, and "other" activities.
11. Your class will then brainstorm places where water might be conserved.
12. Total the number of gallons of water your family used in personal hygiene activities, home maintenance activities, and "other" activities.



# POST-ACTIVITIES

## WATER WISE TIPS

**SHOWER:** Shorten your shower by five minutes and save **20 gallons** of water per day.

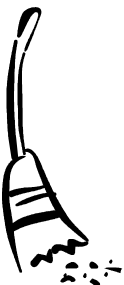


**BRUSHING YOUR TEETH:** Turn the faucet off when brushing your teeth and save **6 gallons** of water per day.

**BATHTUB:** Fill the bathtub only halfway, saving **20 gallons**.



**WATERING YOUR GARDEN:** Water just once per week, deeply, in the early morning to reduce evaporation. Encourage adults to plant native and drought-tolerant plants to reduce watering even further.



**CLEANING HOUSE:** Sweep rather than hose down around the outside of the house and save **150 gallons** of water.

**WASHING DISHES:** Run the dishwasher only when it is full and save **15 gallons** per day.

**WASHING CLOTHES:** Reduce the number of loads you do and save water by running the washer only when it is full.

**WASHING A CAR:** Encourage your family to take the car to a carwash that recycles water. This will save **40 gallons** of water and reduce water pollution!



# POST-ACTIVITIES

## HOME WATER USE WORKSHEET

What It Takes	What You Do	How Many Times? (Place Tally Marks)	Total Gallons
3 gallons	Flushing the toilet		
3 gallons (water left running) 1 gallons (water turned off)	Brushing teeth		
5 gallons / minute (old showerhead) 2.5 gal. / min. (new showerhead)	Shower (Average shower length is _____)		
40 gallons, If full	Taking a bath		
10 gallons	Running dishwasher		
40 gallons	Washing clothes		



## WATERSHED STEWARDS STUDENT SURVEY

1. What is a watershed?

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2. List three ways can you save water at home.

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3. Is your watershed polluted? (*Circle your answer*)

- a. Yes
- b. No
- c. I do not know

4. What types of things pollute your watershed, especially after rain?

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5. What can you do to protect animals that live in your watershed?

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6. List two ways you can help sea turtles.

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7. List at least three ways you can help save your watershed.

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