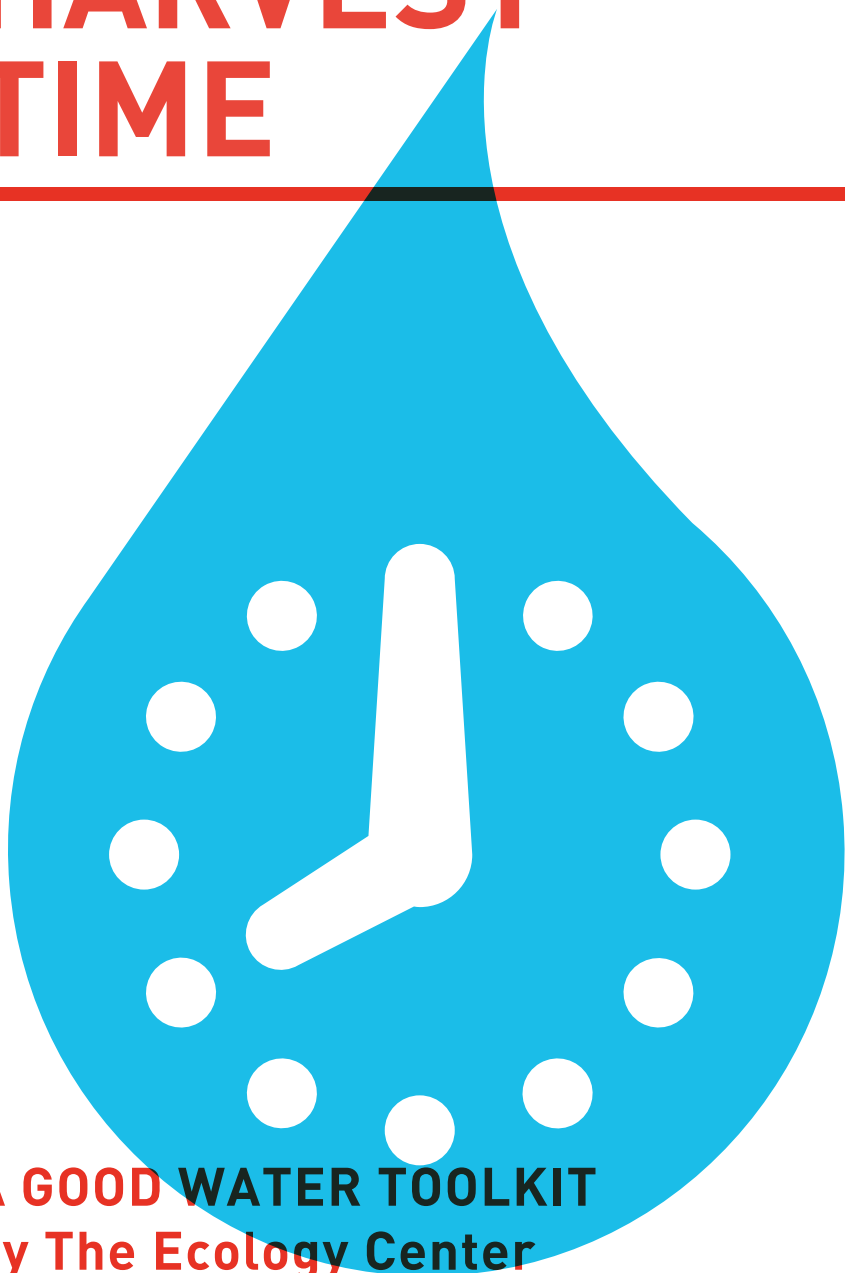

HARVEST TIME



A GOOD WATER TOOLKIT
by The Ecology Center

The Ecology Center, in San Juan Capistrano, is an exciting regional education hub that engages individuals, families, and students in fun, hands-on activities that teach practical, environmental solutions at the household and community level.

Through a variety of programming offerings including unique hands-on field trips, skills-based workshops, lectures, special events and tours, The Ecology Center brings the community together to inspire and create a cultural movement toward a healthy and abundant future for all.

The Center highlights empowering and cutting-edge environmental perspectives that can be applied to the way we live our lives everyday, making it possible for us to coexist with a thriving environment. Individual actions can transform our community, and you can start with actions like the ones you'll find in this Good Water Toolkit.



Visit us online!
theecologycenter.org



Call us!
949.443.4223



Write us a letter, or come say hello in person!

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POWERED BY



and made possible by the
City of San Clemente
Environmental Sustainability Grant



TABLE OF CONTENTS

Harvest Time	5
Case Study: Our Water's Pathway	6
Rainwater! It's Free	9
Our Local Weather	10
Calculating Your Catchment	11
Building Your Own Rain Gauge	12
Building a Rain Barrel	14

VOCABULARY WORDS

Catchment • Water Treatment Facility • Power Plant
Rainwater Harvesting

FOCUS QUESTIONS

These questions can be answered using what you've learned in this booklet. Answer the questions on a separate piece of paper with 1-2 sentences.

1. What is the source of most Southern Californians' water supply?
2. Where does our water go after we use it?
3. What happens to water at a water treatment facility?
4. Draw the pathway of a drop of water from where it starts at the Colorado river to your home and back out to the ocean.



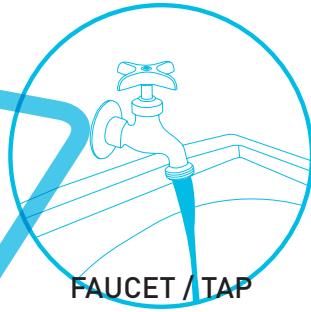
COLORADO RIVER



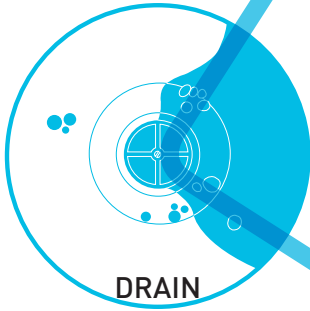
**LAKE HAVASU /
PARKER DAME**



**DIEMER WATER
TREATMENT PLANT**



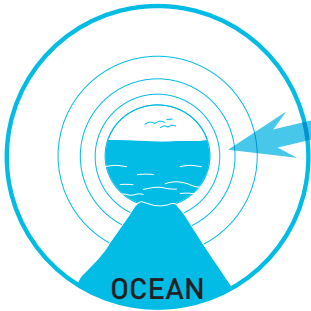
FAUCET / TAP



DRAIN



**JB LATHAM WATER
TREATMENT PLANT**



OCEAN

HARVEST TIME

Turn on the faucet and water appears. Seconds later, it disappears down the drain, never to be seen again. It seems like magic, but water flowing and draining from the tap functions as a result of many specially designed systems that work together. The more we know about where water comes from and where it goes, the better we can act as water stewards in our community. Let's take a journey with water, before the faucet and after the drain!

Where does a city's municipal/publicly supplied water come from?

Municipal and publicly supplied water is drawn from several sources like rivers, lakes and streams or from underground aquifers. It's pumped to a treatment facility for filtration and disinfection -both of which are accomplished with the addition of chemicals.

What water sources supply our community? Most Southern California communities receive their water from either the San Joaquin Delta in Northern California or the Colorado River -over 500 miles away via Lake Mathews in Riverside County. In either case, water travels hundreds of miles to get to your community.

Where does all that water go after we use it? Water goes down our drains to septic tanks or sewage treatment plants. There, it's cleaned and discharged into streams and eventually flows to the ocean. A small portion is reused on golf courses or parks where it eventually seeps back into an underground aquifer.

CASE STUDY: OUR WATER'S PATHWAY

Here in Southern California, we learned our water travels over 500 miles to reach us. We learned it always drains to the ocean. But our water's pathway is more complex -let's explore it!

Colorado River - 500 miles

Local municipalities draw raw, untreated water from surface sources like rivers, lakes and streams or from underground aquifers. In our case the Colorado River.

Lake Havasu/Parker Dam - 250 miles

Used as reservoir storage for Southern California and Arizona's fresh water needs. The construction of Parker Dam created Lake Havasu, and has supplied Los Angeles and San Diego counties since 1941.

Diemer Water Treatment Plant - 45 miles

When ordered by a municipality, water is pumped from a reservoir to a treatment facility for filtration and disinfection - both of which are accomplished with the addition of chemicals.

Faucet

The faucets in our home are connected to the municipal system via under/above ground systems of pipes. When we turn the tap energy is used to pump water through the pipes and out the faucet.

Drain

After we've used it, water is then sent back through municipal piping systems and on to sewage treatment plants where it is cleaned and discharged into the ocean.

JB Latham Water Treatment Plant - 1 mile

The plant receives water from homes, schools, and businesses in our community. A small portion of water is reused on golf courses or parks where it eventually seeps into an underground aquifer.

Ocean - 2 miles

Ultimately, our ocean is the recipient of the water we have used. Keeping pharmaceuticals out of the toilet, pesticides and herbicides off the lawn, oil and debris off the streets, and rainwater in the garden all help keep our ocean clean.



RAINWATER!

Harvest the rain...its free! There is a limited amount of fresh water on the planet. The good news is, we can recycle it endlessly!

Rainwater harvesting is an easy and smart way to recycle water. It involves collecting the water that falls on our roofs instead of letting it run-off to the ocean or seep down into the aquifer.

Rainwater harvesting is great in many ways...

- Water Your Garden

- Wash Clothes or Your Car

- Flush the Toilet

- Drink It!

- Reduce Processing Energy And Costs

- Reduce Harmful Run-Off and Pollution

- Keep Our Oceans Clean

Did you know?

Here in Southern California, we can collect almost 1000 gallons of water from our rooftop with just 1" of rainfall.

Did you know?

The average Southern California lawn uses just over 750 gal/week to stay healthy.

OUR LOCAL WEATHER

Track your weather! Find out the average annual rainfall in your city and around the world... Visit your local library or use these websites:

<http://www.worldclimate.com/>

<http://average-rainfall-cities.findthedata.org/>

<http://www.ocwatersheds.com/StormRainFall.aspx>

What city do you live in? _____

Find out the rainfall for the last 5 years starting with this one.
Record here:

Calculate the mean rainfall for the last 5 years: _____

Calculate the median rainfall for the last 5 years: _____

Calculate the range for rainfall for the last 5 years: _____

Average rainfall for the last 5 years: _____

CALCULATING YOUR CATCHMENT

Imagine how much rain falls on the roof above your head? Let's collect and use every drop! How much rain could you harvest?

Work together as a class, using a tape measure, or string -figure out the square footage of your classroom.

$$(\text{width} \times \text{length} [\text{floor in feet}] = \text{catchment area} [\text{ft}^2])$$

Let's assume the square footage is equal to it's roof. Estimate how much rainwater you could collect:

in one day? _____

in one year? _____

Hint! Most rainfall events in Southern California drop less than or near 1" of rain totaling 12" of rain/ year.

SIMPLE CALCULATION

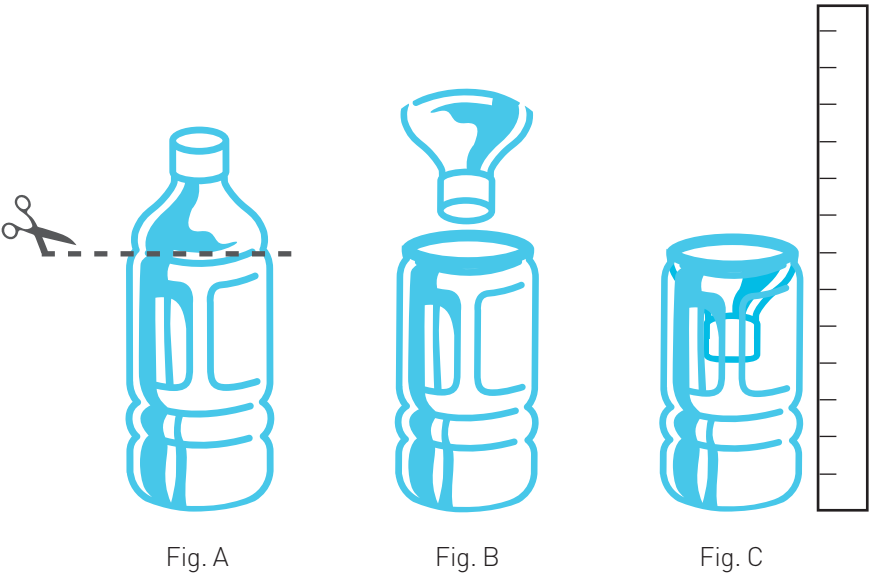
catchment area (ft²)
 x rainfall (ft)
 x 7.48 gal/ ft³

 = maximum runoff (gal)

Remember to convert inches to feet, simply divide rainfall by 12.

Multiply by 7.48 (gal/ft³) to figure out how many gallons you can harvest!

BUILD YOUR OWN RAIN GAUGE



RAIN GAUGE

COST
\$2

TIME
15 minutes
+ wait for rain

TOOLS & MATERIALS:

1 liter bottle, scissors, ruler, journal, shovel

We can measure rainfall at home using a rain gauge. Building your own is easy! Here's how...

FIND IT! Use a plastic bottle. It costs almost nothing to make this nice apparatus. We don't promote the use of plastic bottles but I bet someone in your school is using them. Here is one more opportunity for a re-use recycle project

CUT IT! Cut it's neck on the cylindrical part with a sharp knife. [Fig A]

MAKE IT! The top you just cut will act like a funnel. Invert the top to make a funnel. This funnel will prevent evaporation of water. [Fig B]

INSTALL IT! The empty plastic bottle, being light will fall down or fly away in the slightest breeze. Dig a hole and bury the lower end of the bottle in the ground. This foundation will anchor the bottle in place.

MEASURE IT! After it rains you can measure the rainfall with the help of a ruler. [Fig C]

RECORD IT! Using a journal, keep a record of how much rain you received in a season.

BUILDING A RAIN BARREL



RAIN BARREL CONSTRUCTION

COST
\$50

TIME
1 hour

TOOLS & MATERIALS:

55-gallon barrel @ feed stores or @ www.cruzcontainers.com,
bulkhead set @ aquarium supply, harden faucet @ hardware supply
1 piece of mesh or window screen, elbow fitting (optional)

1. Purchase a clean, 55-gallon, food-grade plastic barrel. Do not use a used barrel or one you retrieved from the dump.
2. Cut a hole the size of your downspout into the top of the barrel or lid. A hole or saber saw will do the trick.
3. Affix a piece of mesh or window screen over the hole in the lid to prevent debris or critters from falling in. If needed, you can attach a 45° elbow to the end of your downspout to reach your barrel.
4. Unscrew the bulkhead and place the threaded stem against the outside of the barrel about 4-6" above the ground.
5. Trace around the stem, and cut out the traced hole.
6. Place one of the rubber gaskets on the stem and push it through the hole so that the base of the stem and rubber gasket are still on the inside of the barrel. The stem should fit snugly.
7. Slide the second gasket onto the stem that is now protruding out from the barrel. Next, screw the washer onto the stem.
8. Tighten it down against the gasket, but avoid over-tightening. You can now thread a garden faucet into the bulkhead, and affix a hose.
9. Position the barrel under a downspout, and do a rain dance!

START SAVING NOW!
PLEDGE TO MAKE A DIFFERENCE
EVERY DROP COUNTS!

Creating a healthy and abundant future for our community is possible! With every pledge you make to reduce your water footprint and protect your watershed, we all take one step closer towards a world with a fresh, clean and abundant supply of water.

GRAB A
BUCKET!

SAVES
5 GAL
/DAY **09**

COST: \$10

TIME: 1 minute

STEP ONE

Grab a bucket.

STEP TWO

Use the bucket to save water. Fill it in the shower while the water is heating up, or under the sink while you wash dishes and/or fruits and veggies.

STEP THREE

Use that water that would have been otherwise wasted to water your garden or rinse out your wetsuit. Every time you fill your bucket, you save gallons from going down the drain, so grab a bucket and put good water to work!



I HEREBY PLEDGE TO
CONSERVE WATER BY
PUTTING A BUCKET
OUTSIDE TO CATCH
RAINWATER:

(signed)

(date)