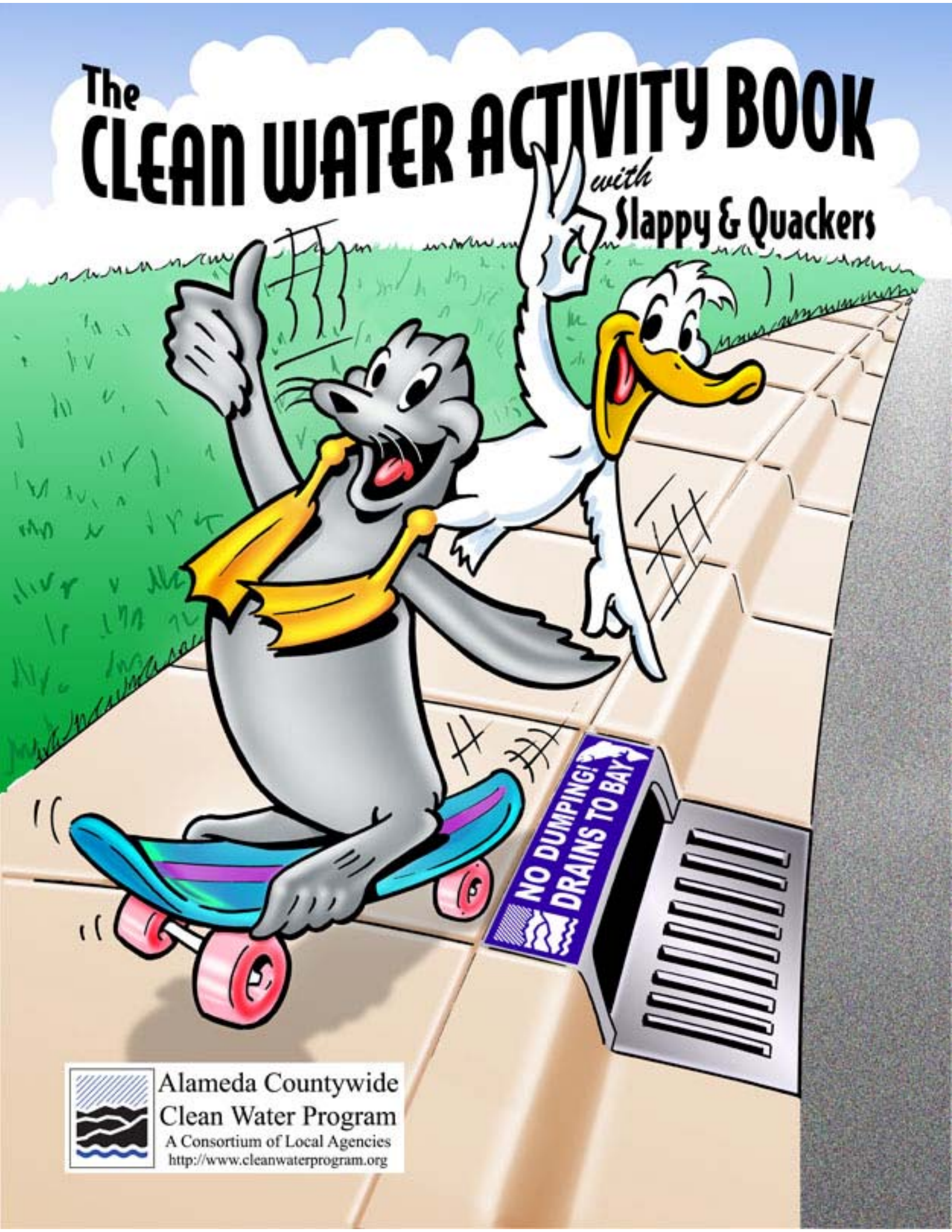
The CLEAN WATER ACTIVITY BOOK with Slappy & Quackers



Alameda Countywide
Clean Water Program
A Consortium of Local Agencies
http://www.cleanwaterprogram.org

When tossed on streets or in parking lots, litter and other pollution can be washed into **storm drains**! All storm drains in Alameda County go to local creeks and the **Bay** without treatment.

Litter and other pollution can be dangers to **wildlife** and damage the **environment**.

Find out where to dispose of unwanted chemicals and other potentially harmful products by calling **1-800-CLEAN UP**.

To find out how to prevent stormwater pollution, visit **www.cleanwaterprogram.org**

WHAT IS THE DIFFERENCE BETWEEN *"STORM"* WATER AND *"WASTE"* WATER?

ACTIVITY:

Color the path of the STORMWATER from the storm drain to the creek and the Bay BLUE.

Color the path of WASTEWATER from the house to the treatment plant YELLOW.

★ Not all chemicals (like paint, pesticides and medications) that are found in households can be cleaned through the wastewater treatment process. Such chemicals should be properly disposed of at a household hazardous waste facility.

Take your car to a **CAR WASH** or wash it over ground that can soak up the water to keep soapy water out of the storm drain.

Soapy water flows into local creeks and the Bay through the storm drain.

NO!

START

YES!

Soapy water is recycled or sent to the waste water treatment plant.

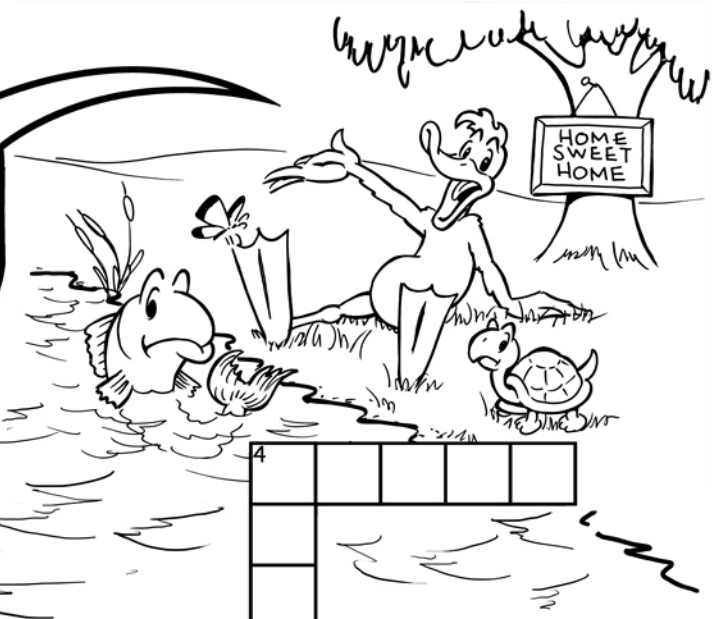
YES!

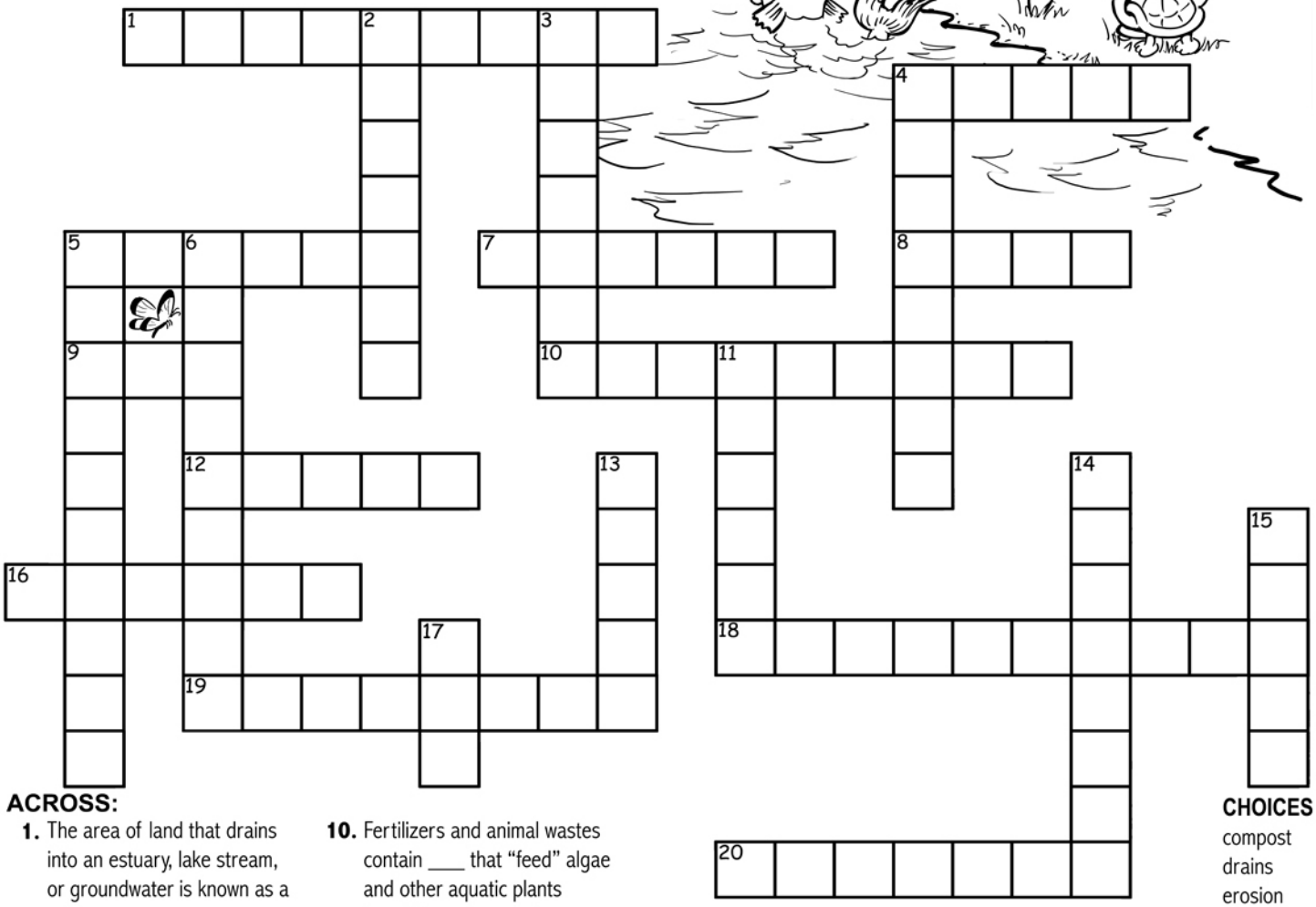
Soapy water is soaked up by grass, dirt, or gravel and does not flow into a storm drain.

IT'S YOUR PLAYGROUND--

BUT IT'S **OUR** HOME!

Do what you can to keep your watershed clean.





ACROSS:

1. The area of land that drains into an estuary, lake stream, or groundwater is known as a ___.
4. The ___ of speeding boats can erode shorelines.
5. Maintaining your ___ tank will help to prevent bacteria and nutrients from leaking into groundwater and surface waters.
7. Wetland plants act like a natural water ___, removing harmful pollutants from stormwater runoff.
8. Leave your grass clippings on your ___ to reduce the need for commercial fertilizers.
9. A single quart of motor ___, if disposed of improperly, can pollute 2 million gallons of water.
10. Fertilizers and animal wastes contain ___ that "feed" algae and other aquatic plants harmful to water quality.
12. Polluted runoff from both rural and ___ sources has a significant impact on water quality.
16. Storm ___ don't connect to sewage treatment plants, so runoff can flow directly to rivers, lakes, and coastal waters.
18. Follow directions carefully when applying ___ on your lawn --- more isn't always better.
19. Polluted runoff (also called ___ source pollution) comes from so many places that it's hard to "pinpoint" a source.
20. Yard and vegetable food waste are suitable additions to a ___ pile.

DOWN:

2. Don't dump used motor oil into storm drains: ___ it!
3. ___ of soil from barren land can cloud nearby streams.
4. ___ prevent flooding, improve water quality, and provide habitat for waterfowl, fish, and wildlife.
5. Marking "Do Not Dump, Drains to Bay" on a ___ is one way to educate people about polluted runoff.
6. Excess sediment, nutrients, toxics, and pathogens are all types of runoff ___.
11. Polluted ___ is the nation's #1 water quality problem.
13. The cattail is one wetland ___ that helps purify polluted runoff.
14. Too much ___ in water can harm aquatic life.
15. Proper crop and animal management on ___ helps to control water pollution.
17. ___ impact development helps control stromwater pollution through conservation approaches and techniques.

CHOICES

compost
drains
erosion
farms
fertilizer
filter
lawn
Low
nonpoint
nutrients
oil
plant
pollution
recycle
runoff
sediment
septic
storm drain
urban
wakes
watershed
wetlands

NO WATER OFF QUACKERS' BACK

Ducks keep their feathers waterproof by spreading oil from a special gland onto their feathers. However, if excess oil gets into streams, lakes or oceans, as in an oil tanker spill or when stormwater carries oil off streets, it can be harmful to ducks and other water birds.

Oil is one of the most common pollutants in our water. Most of the oil in oceans gets there when oil tanks on ships are rinsed while at sea. When ducks and other waterfowl come in contact with oil, their feathers become matted. Oily, matted feathers lose their ability to insulate. Because of this, the birds can die from the cold. When a bird tries to clean the oil off of its feathers, it may swallow some of the oil which can lead to stomach ulcers. The only way to save the oil-covered bird is to scrub it with a detergent, like you might scrub a greasy pan. This is not a perfect solution. It is very expensive and takes a long time to clean birds.

In this activity you will try several ways to clean the oil from the water. These ways are similar to the ones used by clean-up crews in real life spills. Although oil spills do not happen in all areas, it's good to know how hard it is to clean one up.

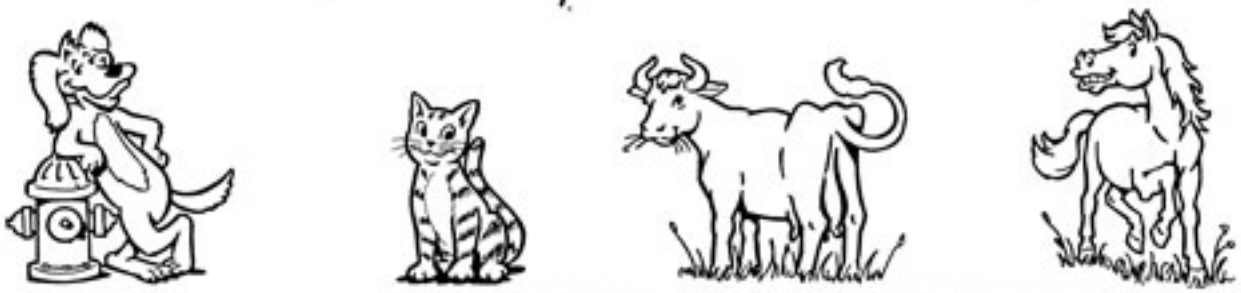
Materials:
one large bowl
one measuring cup
water
cooking oil
different dishwashing detergents
paper towels or a piece of cloth
sponges
string

Procedure:
1. Fill half of the bowl with water.
2. Measure 1/4 cup of oil and pour into the bowl of water.
3. Gently shake the bowl to create "waves". Did the oil and the water mix?
4. Now try to clean up the oil using:
   - Paper towel or cloth.
   - Use string to make a border around the oil and try to drag the oil to one side of the bowl.
   - Use the sponge to try to soak up the oil.

TRY TO CLEAN UP THE OIL WITH EACH METHOD!

Thanks to the EPA for the contents of this page.

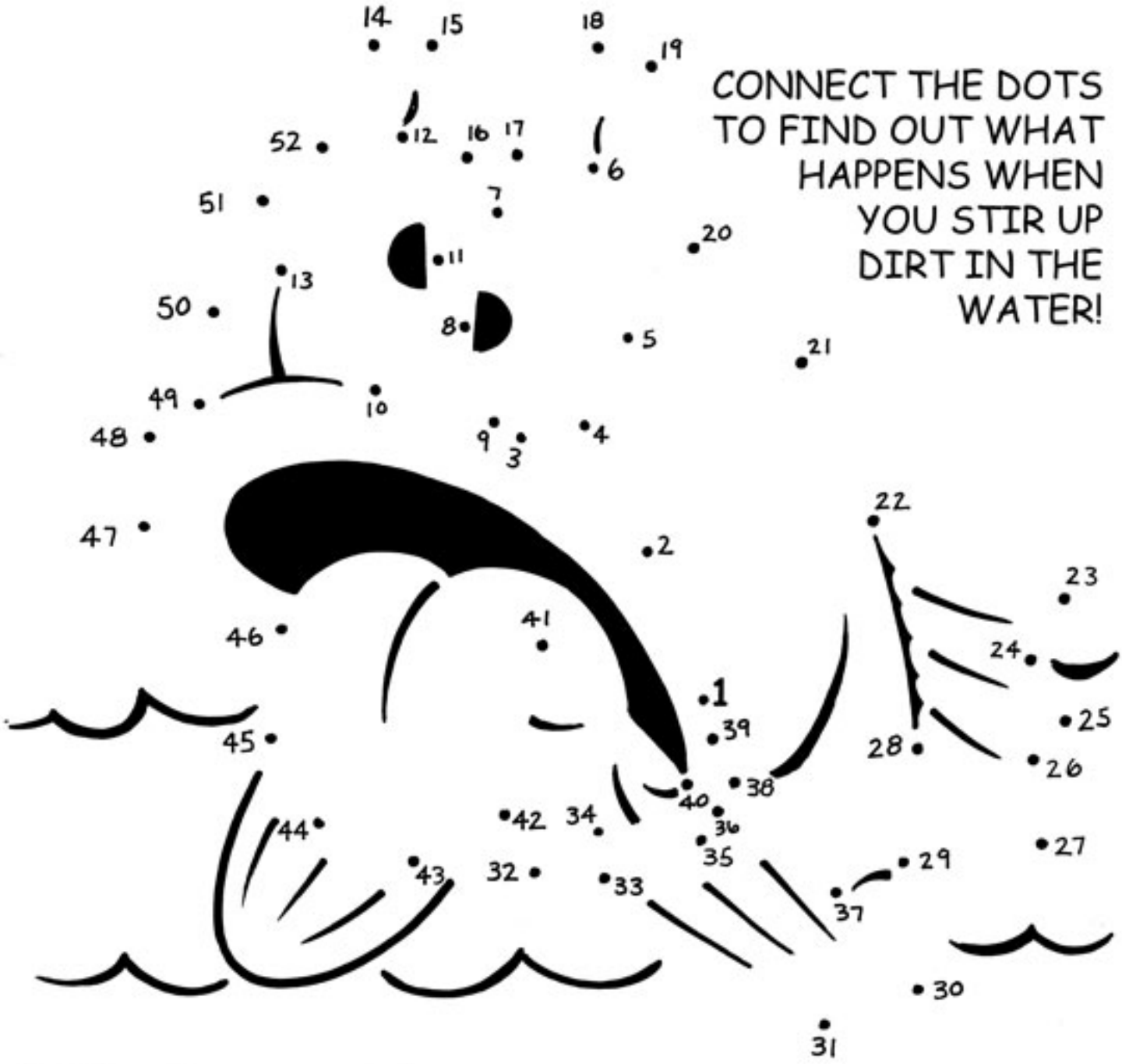
EVERYBODY POOPS, but not in the **creek**! Make sure the poop from these animals finds its way to the trash instead of the creek!



NO NO NO NO!! YES!

ACTION: Pick up after your pet! Your pet's poop can contain bacteria and viruses which could spread to other wildlife. Animals should not poop in or near creeks or other bodies of water. Their poop contributes to algae growth, which uses up oxygen in the water that fish need to survive.

Dirt is a natural part of a creekbed; however, when dirt is disturbed, tiny dirt particles can muddy the water. This can clog the gills of fish, making it difficult for them to breathe.



HERE'S WHAT YOU CAN DO:

1. If you're walking your dog near a creek, stay out of the water to avoid stirring up dirt and disturbing habitat.
2. Avoid walking in deep pools where fish take refuge during the summer.
3. When hiking or biking, stay on the marked trails. This helps prevent erosion and protects our native plants from being trampled.

	A	B	C	D	E	F	G	H	I	J	K	L	M
SECRET CODE	•	••	∴	/	∧	△	|	||	|||	L	⊔	⌜	⊏
	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
	□	⁄	⁄	⁄	:	|-|	▣	◎	▣	▣	▽	⨪	⁄⁄

Water that comes from your _ _ _ O _ _ or from the garden _ _ _ _ _, is piped to us from our local drinking water supplier. Our water supplier _ _ _ _ O _ _ _ _ this water for us to drink by adding very small amounts of a disinfectant to _ _ _ _ O _ the water—such as _ _ _ _ _ _ _ O _ _ _ or chlorine. In order for swimming pools to be safe for us to _ _ _ _ in, we also add very small amounts of chlorine to the water. Chlorine kills _ _ _ _ _ and _ _ _ O _ _ _ _ _ that could make us sick, but it is also very _ O _ _ _ _ _ _ _ _ to fish _ _ _ _, _ _ _ _ _, or _ _ _ water containing chlorine or chloramine should not go down a storm drain because all storm drains flow to local _ O _ _ _ _ _ and the _ _ O _ -home to fish and other wildlife.

NOW... transfer the circled letters to the spaces at the right to discover the solution

ACTION:

If water from a pool or spa needs to be drained, call your local _ _ _ _ _ _ _ _ _ district or wastewater treatment plant for information on how to drain it correctly.

WHAT'S WRONG WITH THIS PICTURE?

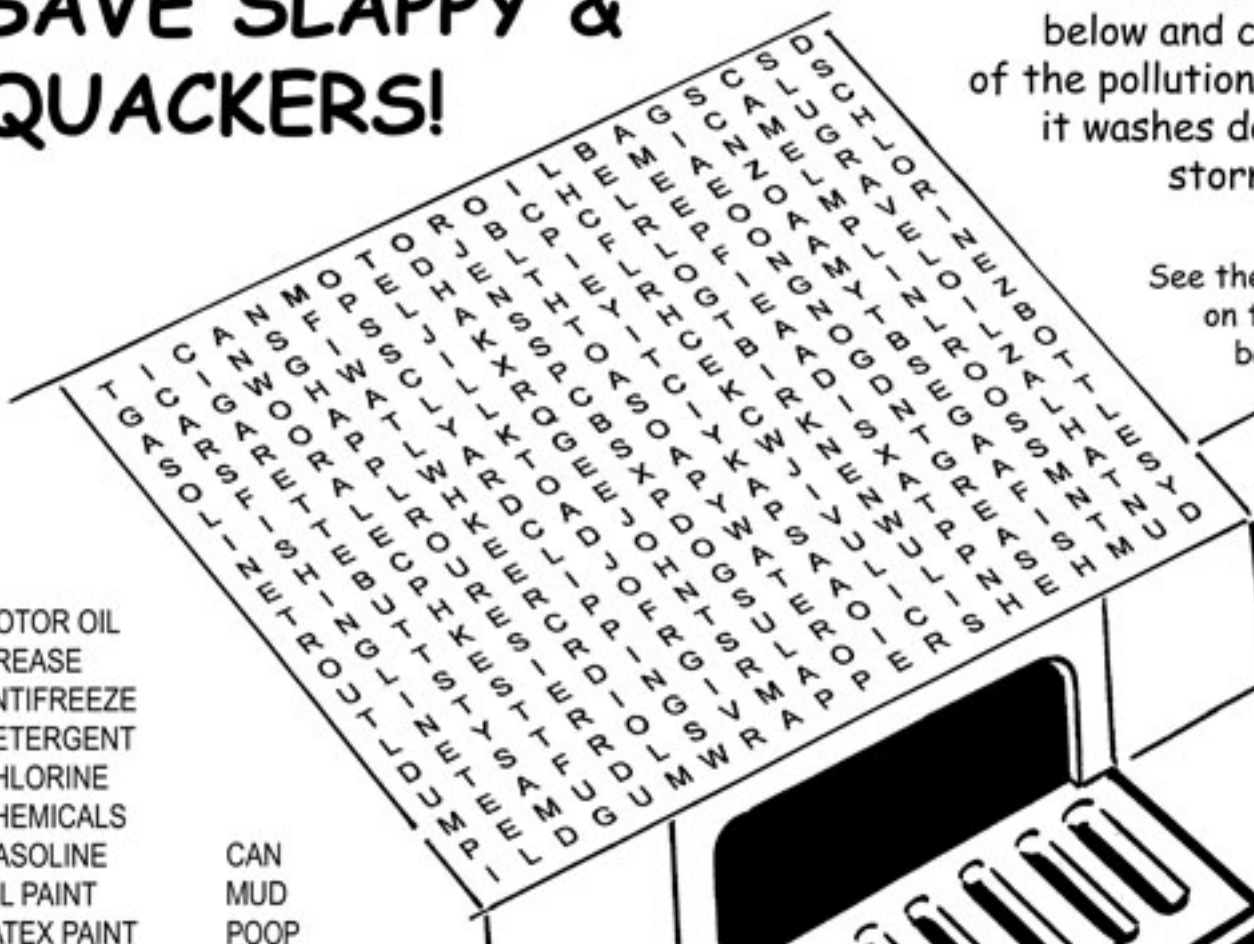
Never dump clippings and leaves from your yard into creek banks or into the creek. Although organic, this material can pile up and kill native creek vegetation which protects the bank from erosion. Instead, compost your yard clippings away from the creek. If your garbage company offers green waste recycling, ask your parents to participate.

To see how many mistakes you correctly identified, refer to the inside back cover.

SAVE SLAPPY & QUACKERS!

Look at the list below and circle all of the pollution before it washes down the storm drain.

See the answers on the inside back cover



MOTOR OIL
GREASE
ANTIFREEZE
DETERGENT
CHLORINE
CHEMICALS
GASOLINE
OIL PAINT
LATEX PAINT
PESTICIDES
YARD CLIPPINGS
SOAPY WATER
POOL WATER
STYROFOAM
PLASTIC BAGS
LEAVES
DIRT
CAN
MUD
POOP
TRASH
STRING
STRAWS
BOTTLES
FISHING LINE
CIGARETTE BUTTS
GUM WRAPPERS
SIX PACK RINGS

MAKE A PROMISE, MAKE A DIFFERENCE!

Draw a picture of an activity you can do to keep water clean. Make a promise to do it and help protect animals from pollution. Write your promise below.

I promise to _____

_____

_____.

I can make a difference in my home, school, and community by keeping my promise above.

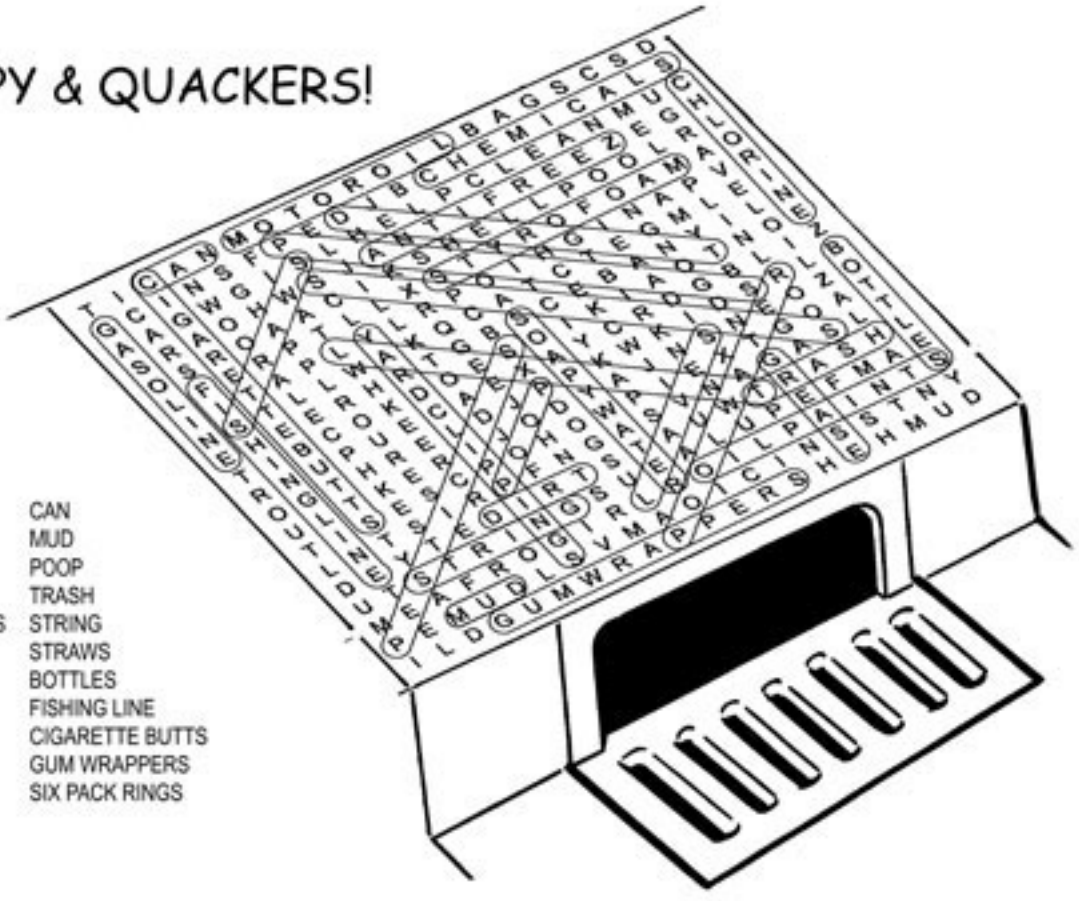
NAME_____DATE_____

Cut and hang to remind you to keep our creeks, lakes, and the Bay clean.

Answers to: WHAT'S WRONG WITH THIS PICTURE?

- Several trees that lined the creek bank and provided shade have been chopped down. Since fish need cool water to live and spawn, the creek no longer provides suitable habitat.
- Someone is chopping tree limbs and letting them fall in the creek. They can be washed downstream and block the flow of water.
- Someone is tossing a stick for his dog and letting the dog run through the creek. This stirs up the creek bottom and muddies the water, making it difficult for fish to breathe. Sediment from the bottom of the creek could settle over fish eggs, smothering them. If you or your animal run through the creek, you could be destroying the eggs.
- The woman is applying a pesticide close to the creek. The spray can be washed into the creek where it can pollute the water and kill aquatic insects.
- Someone piled a bunch of leaves on the creek bank and they are falling into the creek. This can affect the oxygen level of the creek and kill fish and other aquatic life. (Leaves and other organic waste give off nitrogen as they decompose. The more nitrogen in the water, the less oxygen there is for the fish and aquatic life.)
- The man is cutting his lawn and the clippings are going into the creek. Decomposing lawn clippings have the same effect on the water as decomposing leaves.
- A bundle of woody debris has lodged under the bridge--potentially blocking the flow of the creek and causing a flood. However, woody debris isn't always a bad thing. For example, when a tree falls in a creek, it can provide habitat for creek critters and slow the flow of rushing water. For information on managing woody debris properly, call your local public works department.

Answers to: SAVE SLAPPY & QUACKERS!



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OTHER ACTIONS YOU CAN TAKE TO PROTECT OUR CREEKS AND THE BAY

- **ACTION: Don't release balloons into the environment and do toss your plastic lunch bags into the trash (or save and re-use them).**
  WHY: Balloons and plastic bags can be swept hundreds of miles out to sea by currents. Deflated balloons and bags are mistaken for food by some animals (e.g. sea turtles and dolphins) that end up starving because the plastic interferes with their digestive systems.

- **ACTION: Cut up 6-pack rings, always properly dispose of trash, and remember to recycle.**
  WHY: Wildlife can become injured by plastic debris, including 6-pack rings, fishing lines, water bottles and Styrofoam.

- **ACTION: Pick up pet waste. Ask your parents to take their car to the car wash.**
  WHY: Dirty water can contaminate a creek and be harmful to fish and other aquatic life.

- **ACTION: Prevent erosion by staying on marked trails when hiking or biking.**
  WHY: Erosion can create loose dirt in creeks. The dirt clouds the water and makes it difficult for fish to breathe. Erosion can also cause the creek banks to crumble into the water.

- **ACTION: Learn the difference between good bugs and pests.**
  WHY: Not all bugs are bad. Bugs such as spiders and ladybugs will eat house and garden pests such as ants and aphids and reduce the need to use pesticides.

All storm drains in Alameda County lead to local creeks, lakes, and the Bay where wildlife like Slappy and Quackers live. Help keep their homes clean by putting litter in the trash where it can't enter storm drains.

The Alameda Countywide Clean Water Program (ACCWP) gratefully acknowledges the Marin County Stormwater Pollution Prevention Program (MCSTOPPP) for booklet concept and design, and Joal Morris (www.joalmorris.com) for Illustrations.