Marine Debris Toolkit

Introduction to Marine Debris

Planet Earth

Historically there are 5 named oceans

Google Earth

…but these 5 oceans are not separate bodies of water.

These 5 oceans form one continuous ocean mass.

Google Earth

They are each part of one global ocean system.

This vast body of water covers 71% of our planet.

Google Earth

Question:
Why do we call our planet "Earth" when most of the planet is covered in water?

Google Earth

Maybe we should call our planet – **OCEAN**!

OUR WORLD OCEAN

provides

THE AIR WE BREATHE

>50% The ocean produces over half of the world's oxygen and absorbs 50 times more carbon dioxide than our atmosphere.

CLIMATE REGULATION

70% Covering 70% of the Earth's surface, the ocean transports heat from the equator to the poles, regulating our climate and weather patterns.

TRANSPORTATION

76% Percent of all U.S. trade involving some form of marine transportation.

RECREATION

From fishing to boating to kayaking and whale watching, the ocean provides us with so many unique activities.

ECONOMY

$282 billion Amount the U.S. ocean economy produces in goods and services. Ocean dependent businesses employ almost 3 million people.

FOOD

The ocean provides much more than just seafood. Ingredients from the sea are found in suprising foods such as peanut butter and soymilk.

MEDICINE

Many medicinal products come from the ocean, including ingredients that help fight cancer, athritis, Alzheimer's disease, and heart disease.

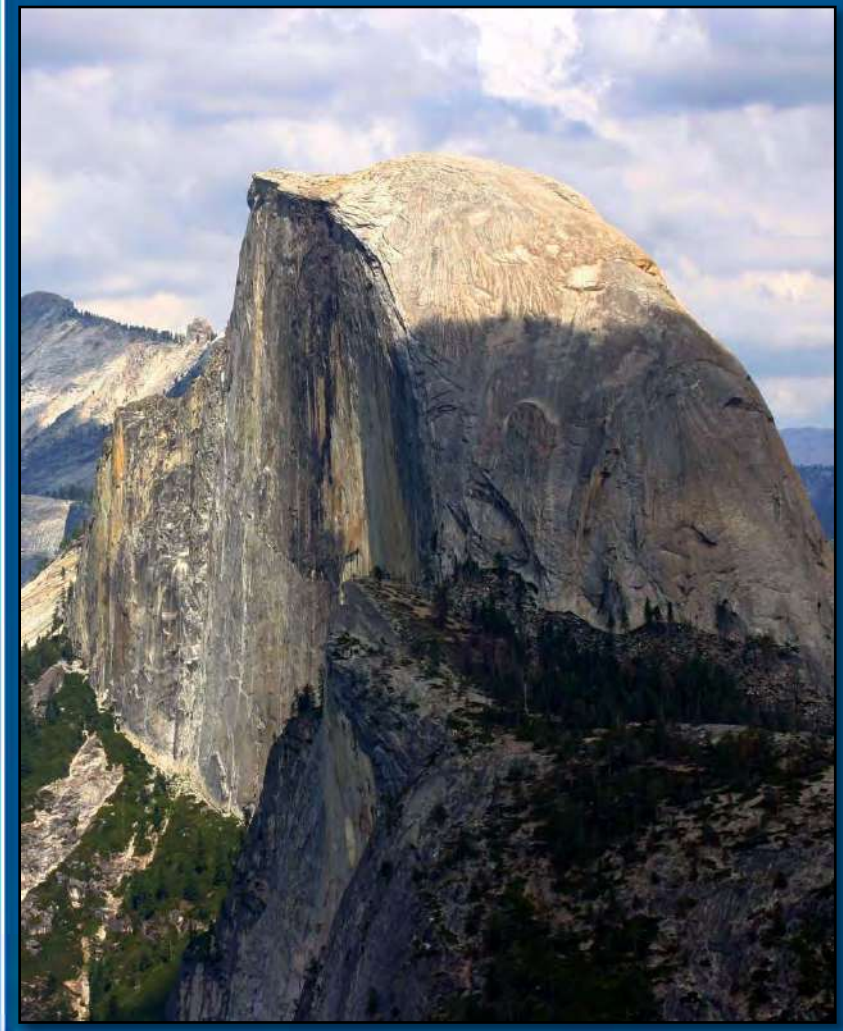
The ocean is a place to explore and enjoy!

Even though the ocean covers most of our planet, we know so very little about it. As a matter of fact, we know much more about land than the sea. We've only begun to get a glimpse of the many mysteries and stories that the ocean has to tell.

But we do know this…

We have only ONE ocean and we have to take care of it!

Our country's national parks such as Grand Canyon, Yosemite and Olympic protect large wilderness areas on LAND.



About 40 years ago, our government realized that we needed to also protect the wild areas **UNDER** the water, in our ocean and Great Lakes and along our coasts.

National Marine Sanctuaries

These underwater parks are called **NATIONAL MARINE SANCTUARIES** and they make up the **National Marine Sanctuary System**.

There are 13 national marine sanctuaries all over the United States including one in the Great Lakes (Lake Huron) called Thunder Bay National Marine Sanctuary.

There's also an underwater national monument in the Hawaiian Islands called **Papahānaumokuākea Marine National Monument**.

The National Marine Sanctuary System promotes conservation, stewardship and ocean research.

There are also shipwrecks and other cultural resources in many of the national marine sanctuaries which are kept safe in sanctuary waters where they can be studied over time.

The National Marine Sanctuary System is overseen by a government agency called NOAA.
NOAA stands for the **N**ational **O**ceanic and **A**tmospheric **A**dministration,
but everyone calls it NOAA (pronounced "Noah").
The people who work for NOAA study our climate and weather as well as the ocean.

Take a look beneath the ocean's surface…

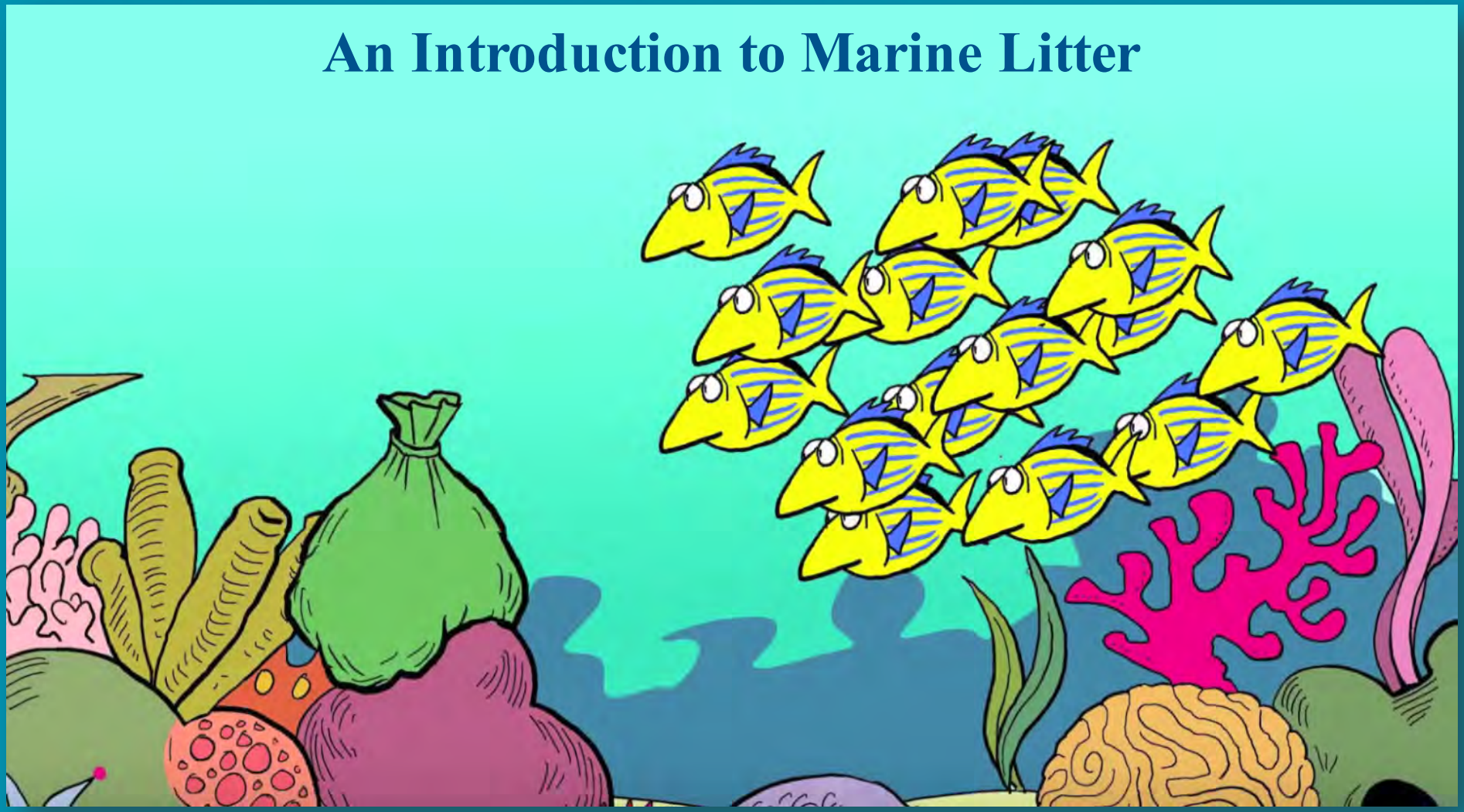
You will find magnificent organisms – small and large!

What else lies beneath the ocean’s surface?

Marine Debris is a Global Environmental Issue

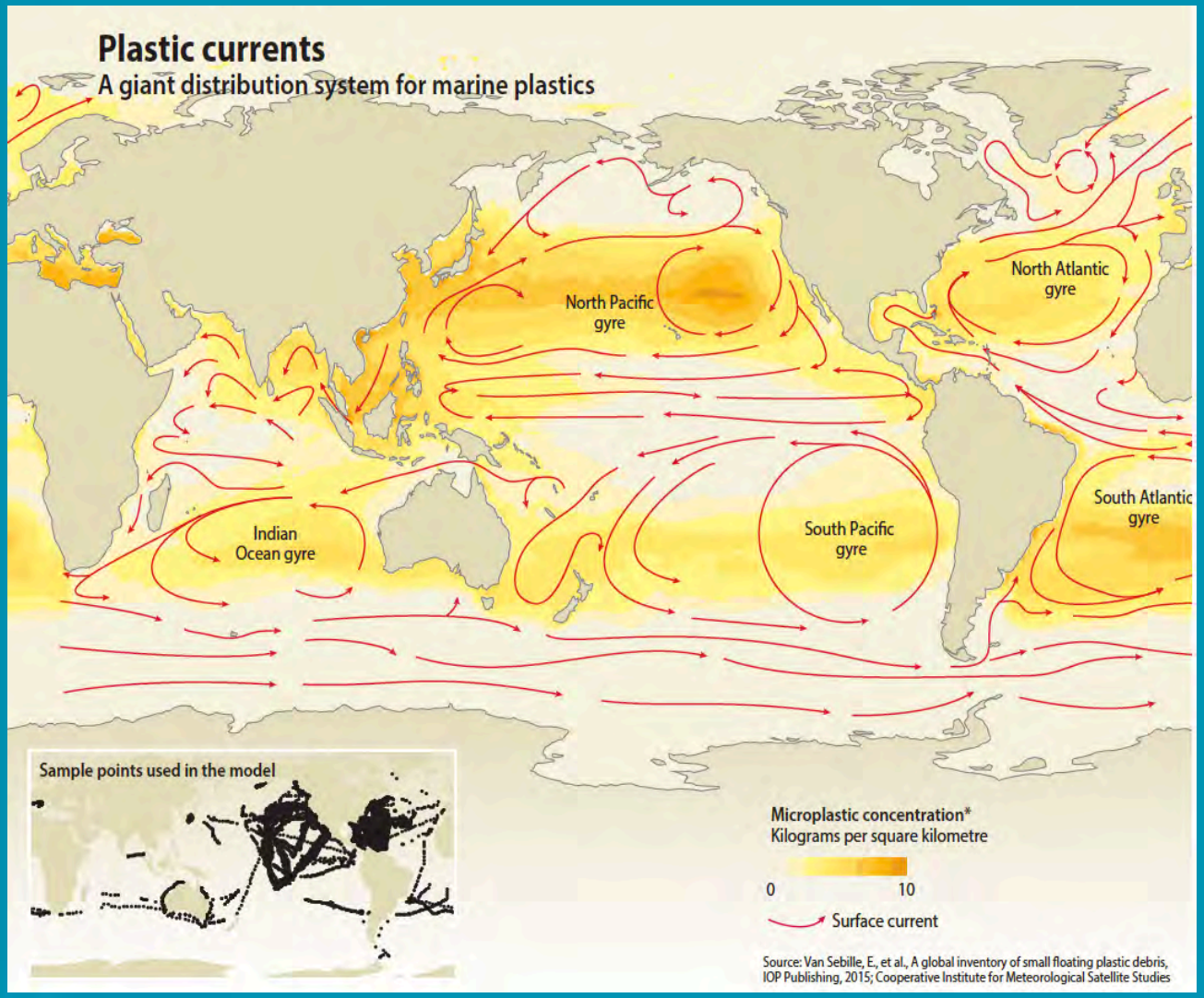
Trash can be found in all areas of the ocean, including…

Where does the trash come from?



https://www.youtube.com/watch?v=DtfAhy2lgAA

What are gyres?



- Many believe that the "Pacific Garbage Patch" is a floating island of large plastic debris.
- However, most of the debris found in this area are small pieces of floating plastic that are not noticeable to the naked eye.
- Wind and wave action continuously mixes this debris in a whirlpool like motion, forming a ***gyre***.

Learn more about the Great Pacific Garbage Patch: http://oceantoday.noaa.gov/trashtalk_garbagepatch/welcome.html

What is the difference between a macroplastic and a microplastic?

What is a macroplastic?

Large piece of plastic –
measuring greater than 5 mm in diameter

What is a microplastic?

Small piece of plastic –
measuring less than 5 mm in diameter

The Issue with large pieces of plastic: **Plastic Entanglement**

Marine animals often get tangled up in macroplastic litter – making it difficult for them to move or eat. Plastic entanglement can be deadly.

Plastic Ingestion

Animals often mistake plastic litter for their natural food source – such as *jellies*, *small fish*, or *krill*. Organisms as small as plankton have been known to ingest plastic litter.

Once in their stomachs, plastic pieces can build up and cause blockages – making it hard for the animal to digest its food.

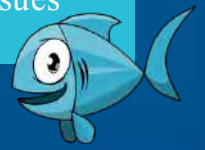
How can plastic ingestion harm humans?

Toxins, from plastic factory to fork

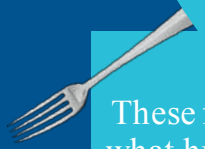
Plastic products are often made using harmful toxins

Once in the ocean, plastic particles can absorb more toxins from the surrounding environment

When fish ingest plastic particles, the toxins in the plastic are absorbed by their fatty tissues



These fatty tissues are what humans eat when we consume fish



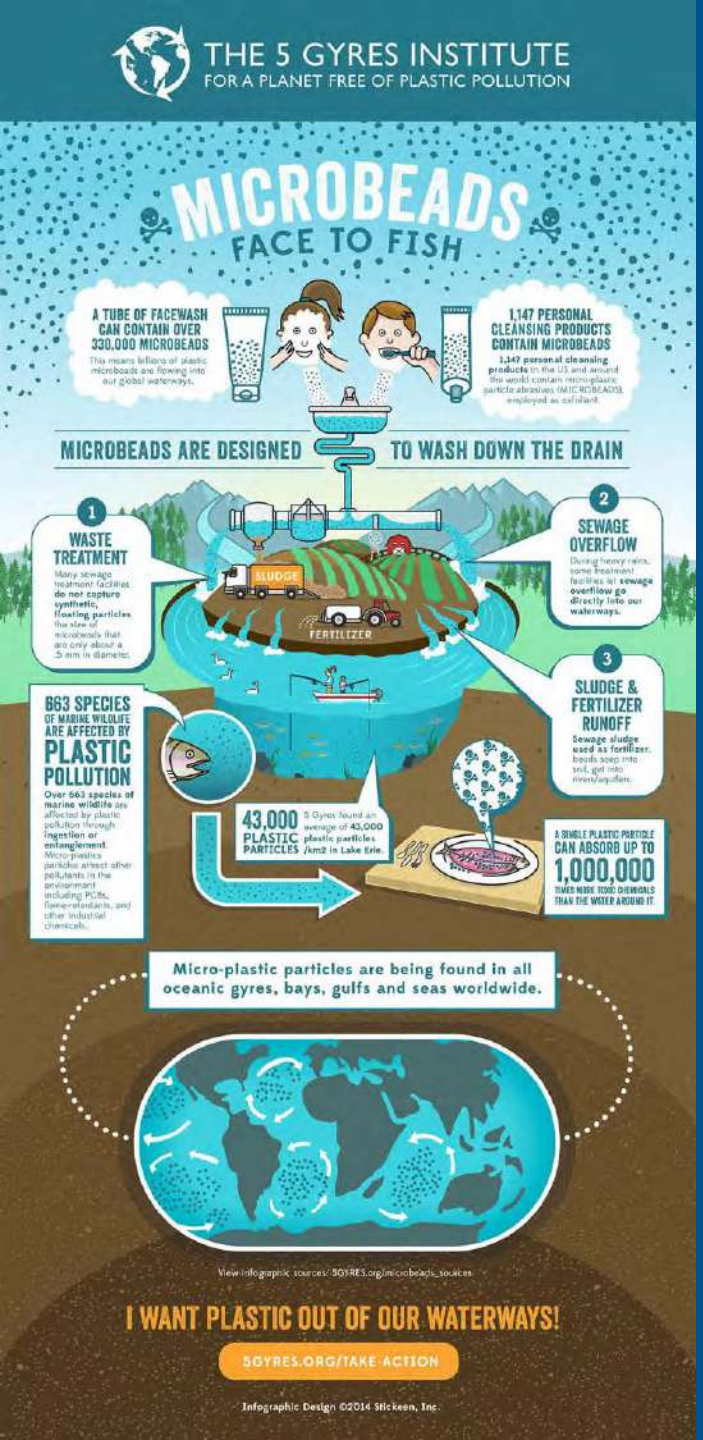
Scientists are currently studying if and how these toxins may be harmful to human health.

Image sources: http://www.clipartkid.com/images/557/chemical-reaction-clipart-clipart-panda-free-clipart-images-h6RAtx-clipart.png
http://clipartix.com/wp-content/uploads/2016/05/Waves-sea-wave-clipart.png
http://files.focusky.com.cn/web/demo/economic-theones/files/extfiles/ext_02015514163119737.png
http://pngimg.com/upload/fork_PNG3067.png
http://www.mes-conference.ru/images/awards/questionMark.gif

Journey to microplastics

How do big plastic pieces break down?

When plastic litter interacts with waves and sunlight it breaks down into tiny little pieces.



Plastic Microbeads

Have you seen these?

Plastic microbeads are found in many cosmetic products such as face wash and toothpaste.

These tiny little beads are designed to wash down the drain, but where do they go after that?

A Victory for the Ocean:
The Federal Microbead-Free Waters Act of 2015 has banned the sale of products containing microbeads starting in July 2017!

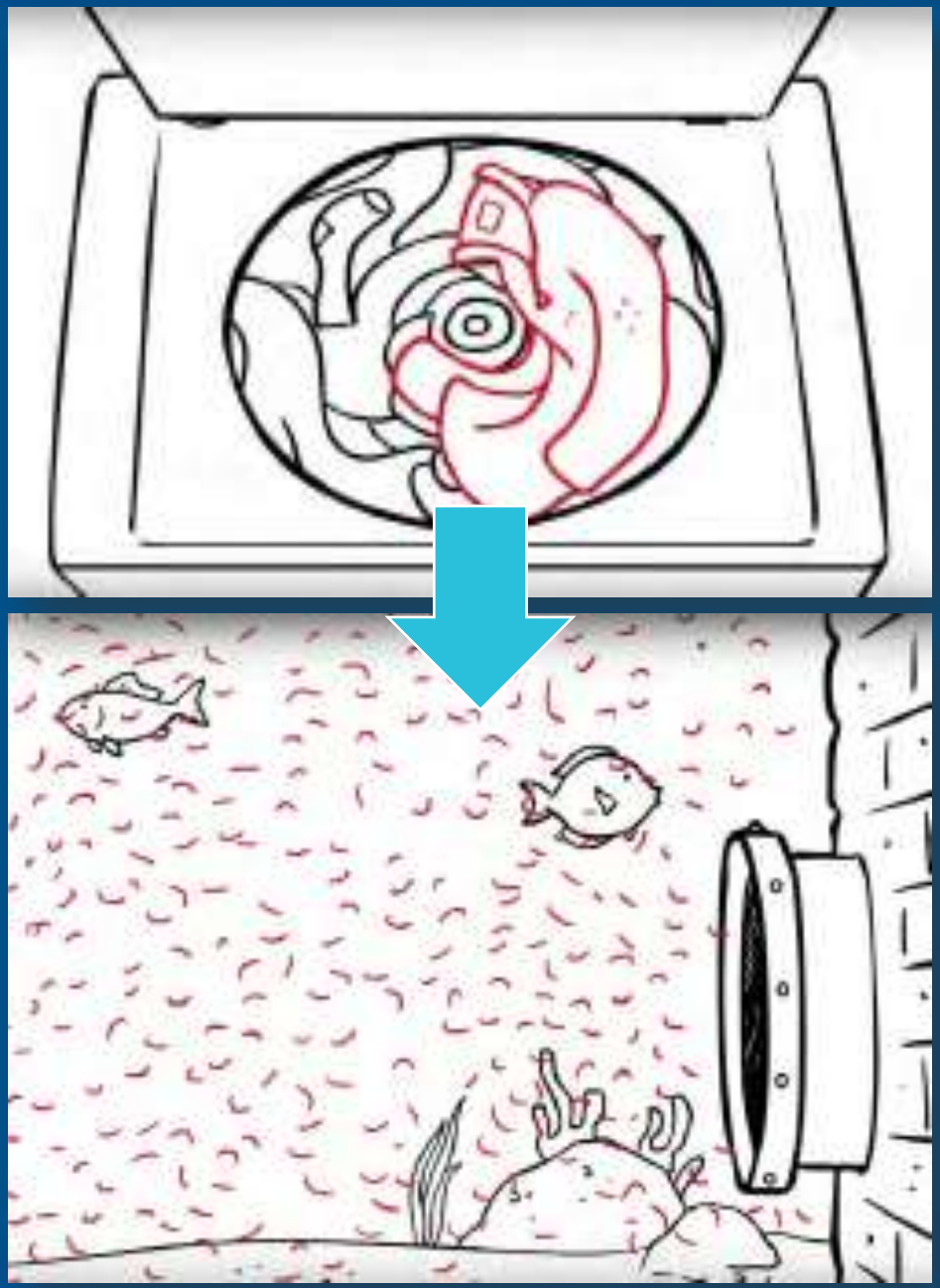
https://www.youtube.com/watch?v=uAiIGd_JqZc

Microfiber Pollution

Microbeads are not the only tiny pollutants found in marine environments.

Tiny plastic fibers that shed from our synthetic clothes in the washing machine are now being found in waterways and the ocean. What happens once they reach the ocean?

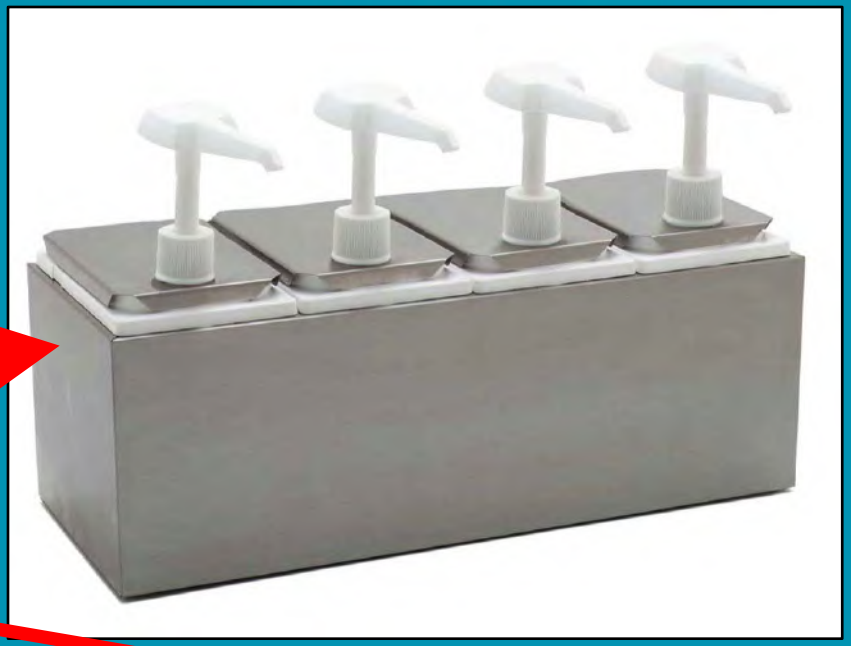
The Story of Stuff:
http://storyofstuff.org/movies/story-of-microfibers/



What can YOU do?

Reduce Waste at Your School

- Step up your recycling and composting efforts
- Replace single-use condiment packets with bulk dispensers
- Replace spork packs with bulk utensil dispensers
- Refuse plastic straws or use paper straws instead
- Power down all electronic devices when not in use



USDA
United States Department of Agriculture

REDUCING FOOD WASTE

WHAT SCHOOLS CAN DO TODAY

USDA's Economic Research Service estimates

31% of the overall food supply at the retail and consumer level **went uneaten** in the U.S. in 2010

Research shows **PLATE WASTE NOW** = **PLATE WASTE BEFORE** updated nutrition standards

Scheduling recess before lunch can **reduce plate waste by AS MUCH AS 30%**

Extending lunch periods from **20 TO 30 minutes reduced plate waste by nearly one-third**

SMARTER LUNCHROOM STRATEGIES, such as **how foods are named** and **where they are placed in the cafeteria,** can facilitate healthy choices and increase fruit and vegetable consumption by **UP TO 70%**

SCHOOLS ACROSS THE COUNTRY ARE STEPPING UP TO THE CHALLENGE WITH INNOVATIVE NEW STRATEGIES, SUCH AS:

- Allowing students to keep a lunch or breakfast food item for consumption later in the school day
- Using techniques listed on the Smarter Lunchrooms Self-Assessment Score Card to help reduce food waste
- Setting up a table for kids to place items they are not going to consume (packaged or pre-portioned items)
- Letting kids self-serve
- Composting food waste for school gardens
- Collaborating with local farmers on composting or food-scrap projects
- Collecting excess wholesome food after mealtimes to donate to charitable organizations
- Sign up for the U.S. Food Waste Challenge to share your story on how you are reducing, recovering, or recycling food waste

Start in your cafeteria:

- Encourage students to take only what they need
- Place recycling bins in areas where trash is often found
- Create a *share bin*: where students can leave items that they did not eat for others to take

Make Art **NOT** Trash!

Bottle Cap Mural at Carmel River School – Carmel, CA

Art projects are a great way to spread the message about **going green**, and **thinking blue**! Use trash found on your campus to create a captivating mural.

Reduce Waste in Your Community

Ways to keep your community clean:

1. Participate in a beach, river, or park clean-up
2. Reach out to local restaurants to encourage them to reduce their waste
   - **Straws** are a great place to start – encourage local restaurants to serve straws only upon request
3. Write to your local government officials to inspire them to take action
4. Spread the word about zero waste to your friends and family members

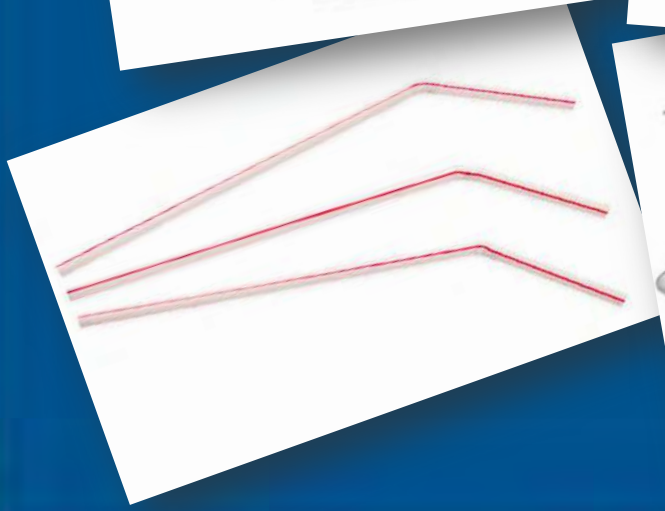
Remember: change in your community starts with **YOU**.

Set an example for your peers by keeping your community free of debris!

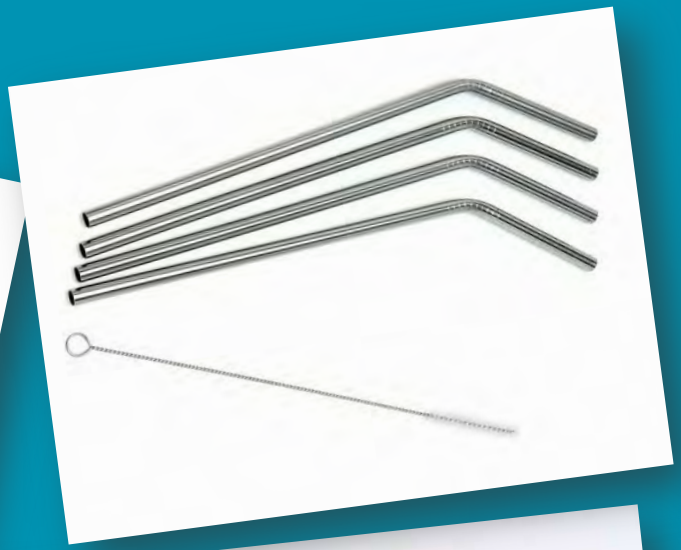
Reduce Waste at Home

You and your family members can take similar steps to reducing waste in your home by: using less plastic products, repurposing items before throwing them away, recycling, and choosing to use reusable items…

Refuse Single-use Plastics



Choose Reusable Items!



YOU have the power to make a change…

https://www.ted.com/talks/melati_and_isabel_wijsen_our_campaign_to_ban_plastic_bags_in_bali?language=en

Melati and Isabel Wijsen are teenage activists that launched the campaign "Bye Bye Plastic Bags."

YOU can be the change too!

What will YOU do to protect the ocean & the organisms that depend on it?