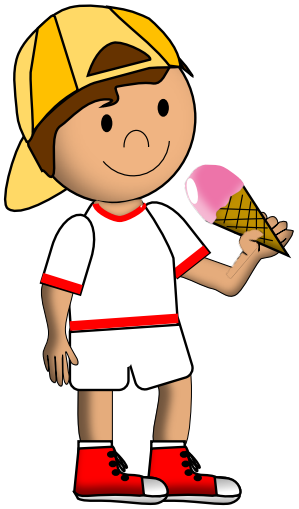
“One scoop in a cone, please!“



discover your science

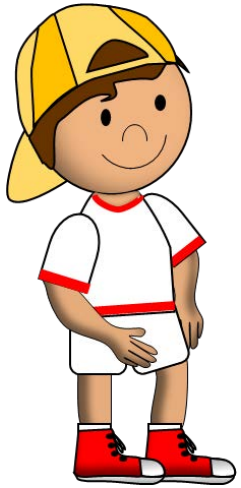
An interactive science labbook on occean pollution

Welcome to this interactive science labbook!

Join us on a journey following the fate of a piece of plastic in the ocean and explore the science behind plastic pollution.

We hope you enjoy the activities about plastic in the oceans and how we can all help to keep our oceans clean.

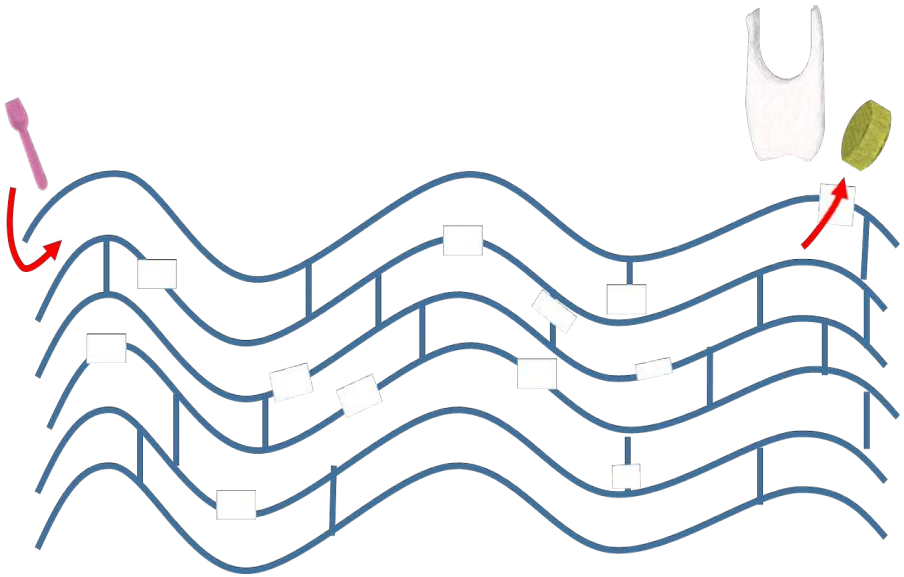
We will look at answers to these three questions:



1. What is happening to the plastic in the ocean?
2. What are possible threats of very tiny plastic bits?
3. What can all of us do to help keep our oceans clean?

What do you like to do at the beach?
Will you draw a picture?

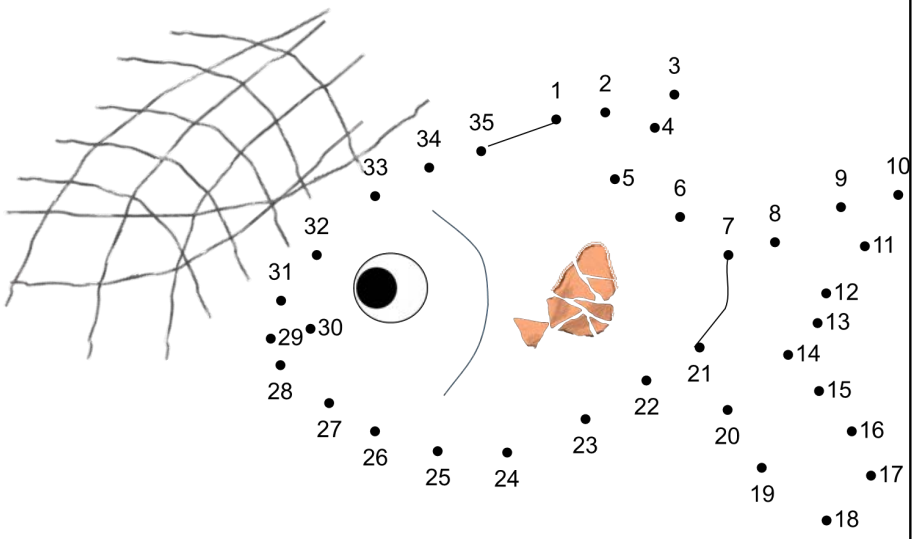
See if the ice cream spoon ends up with the other garbage!



Shocking number!

8.000.000 tons of plastic end up in our ocean each year!

Connect the numbers and see the danger the plastic pollution causes in the ocean!



Shocking number!

Plastic bits have been found in the stomachs of over **700 different marine animals!**

Perform this activity and discover if all plastic floats in the ocean!

Activity:

Does all plastic float?

You need

- a plastic or glass bowl
- water
- some plastic toys or kitchen utensils

Instructions

- Fill the bowl with water.
- Before dropping the toys into the water think about what will happen. Write down your expectation on the clipboard.
- Drop the items into the water and watch what happens.
- Do you oberseve what you expected?

Further testing

- make waves or blow like the wind.

SCIENCE NEWS

Objects that are less dense than water float at the surface. Objects that are denser will sink to the ocean floor.

Based on the data collected through a number of explorations, scientists can now describe the fate of different plastic items. Indeed, it is predicted that there is more 30 times as much plastic on the ocean floors than as at the surface!

Depending on where the plastic litter ends up it will have different affects on marine life and our whole ecosystem.

Source: Physics Today 68, 2, 60 (2015)

Perform this activity and discover how waves move!

Activity:

Create your own waves in a bottle

You need

- a plastic or glass bottle
- water and some food coloring
- cooking oil

Instructions

- Fill the lower part of the bottle with water and add some color.
- Cover the water with oil and close the bottle.
- Wait some time for the air bubble to dissovle.
- Tilt the bottle and explore your own litte ocean in the bottle.
- Add a small toy and discover how it is carried by the waves.

Perform this activity and make currents!

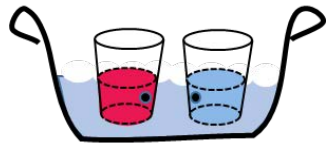
Activity:

Ocean currents

You need

- a tub with water
- two containers (paper cups or cut-up milk cartoons)
- hot water and ice cubes
- two different food colors
- two push pins

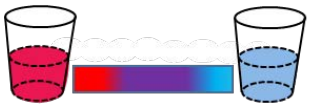
Set-up:



What will happen?

- The two colors will mix?

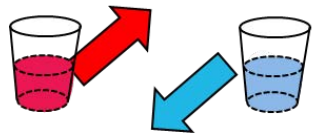
Expectation:



What happened?

- The hot water went up to the surface.
- The cold water went low.

Observation:



SCIENCE NEWS

Like a conveyor belt the ocean currents can carry garbage a great distance.

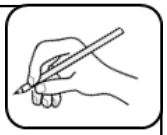
But how about the garbage that ends up in rivers? This was investigated by a team of scientists on the research schooner *Tara.*

Over a period of 6 months, they voyaged along the 4 European sea fronts and took samples from 9 big rivers in Europe. With this and previous missions, scientists are able to track the origin of plastic debris and confirm that “plastic roams free”.[1]

So, all of us have to help to reduce the amount of plastic that ends up in the environment.

[1]Source: https://oceans.taraexpeditions.org

Can you find the words from the EMBL reseach project in the word grid?



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

nano X-rays toxins research
synchrotron solution flat sticky

Perform this activity and magnify small secrets!

Activity:

Looking at smaller stuff

You need

- a flat, transparent suport (for example a ruler)
- water and (optionally) a paper straw or uncooked macaroni pasta

Instructions

- With your straw or macaroni carefully transfer a water bubble onto your ruler.
- Push the ruler over small writting and see that the letters appear larger.
- Can you use this “lens“ to magnify the surface of a stone? Or look for fingerprints?

Further testing

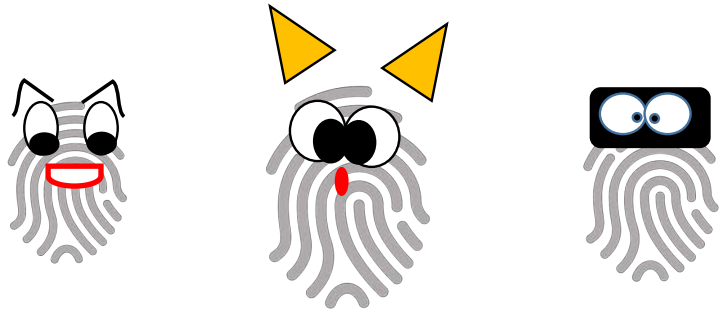
- Use a marble instead of water. What happens if you use oil instead of water?
- Or play fun tricks with a water glass.

Can you use your small magnifiying lens to look at your finger prints? How about making little monsters afterwards?

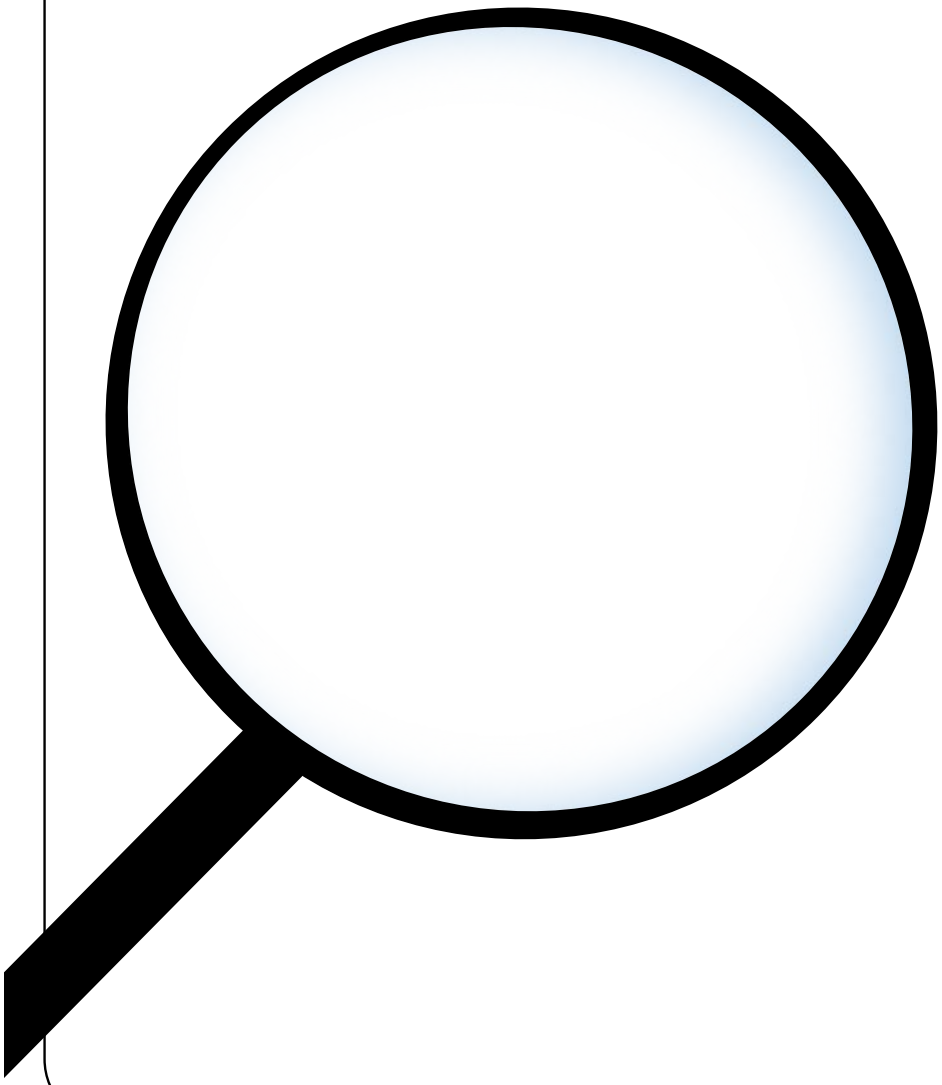
My prints

Left hand

Right hand



What else would you like to look at with a magnifying glass?



Perform this activity discover how “sticky” plastic can be!

Activity:

Attractive plastic

You need

- different plastic "rods“, such as a ruler, plastic cuttlery
- pieces of paper: confetti, hole puncher holes, ripped up paper
- serviettes (napkin) and other types of textile (e.g., wool, cotton)

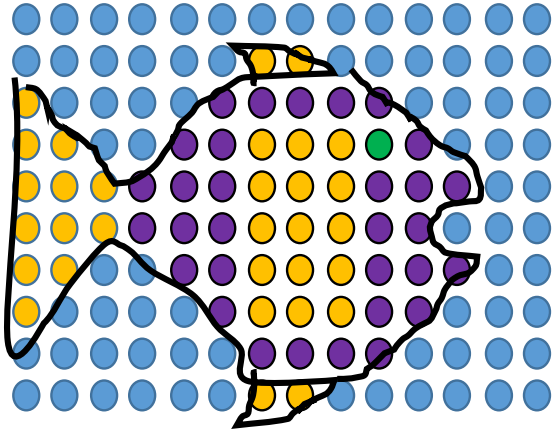
Instructions

- Use the serviette to rub the plastic rod.
- Hold the rod over the paper and watch what happens.
- Which combination of plastic and textile leads to the biggest attraction?

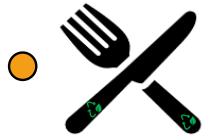
Further testing

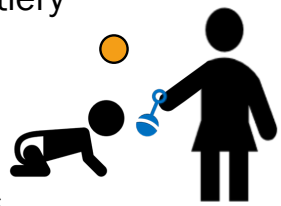
- How about separating salt from pepper?

After the experiment you can use the confetti and make a picture. You can also color the dots and make a pattern!

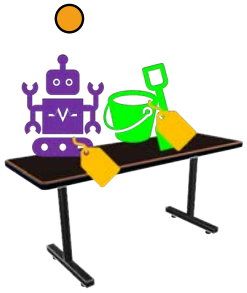


Can you connect the pictures to the small steps for cleaner oceans?





- upcycling (art)
- telling others
- selective shopping
- recycle
- reusable soap bottles
- glass water bottles
- biodegradable cuttlery
- flea markets
- passing down toys
- cotton/paper bags

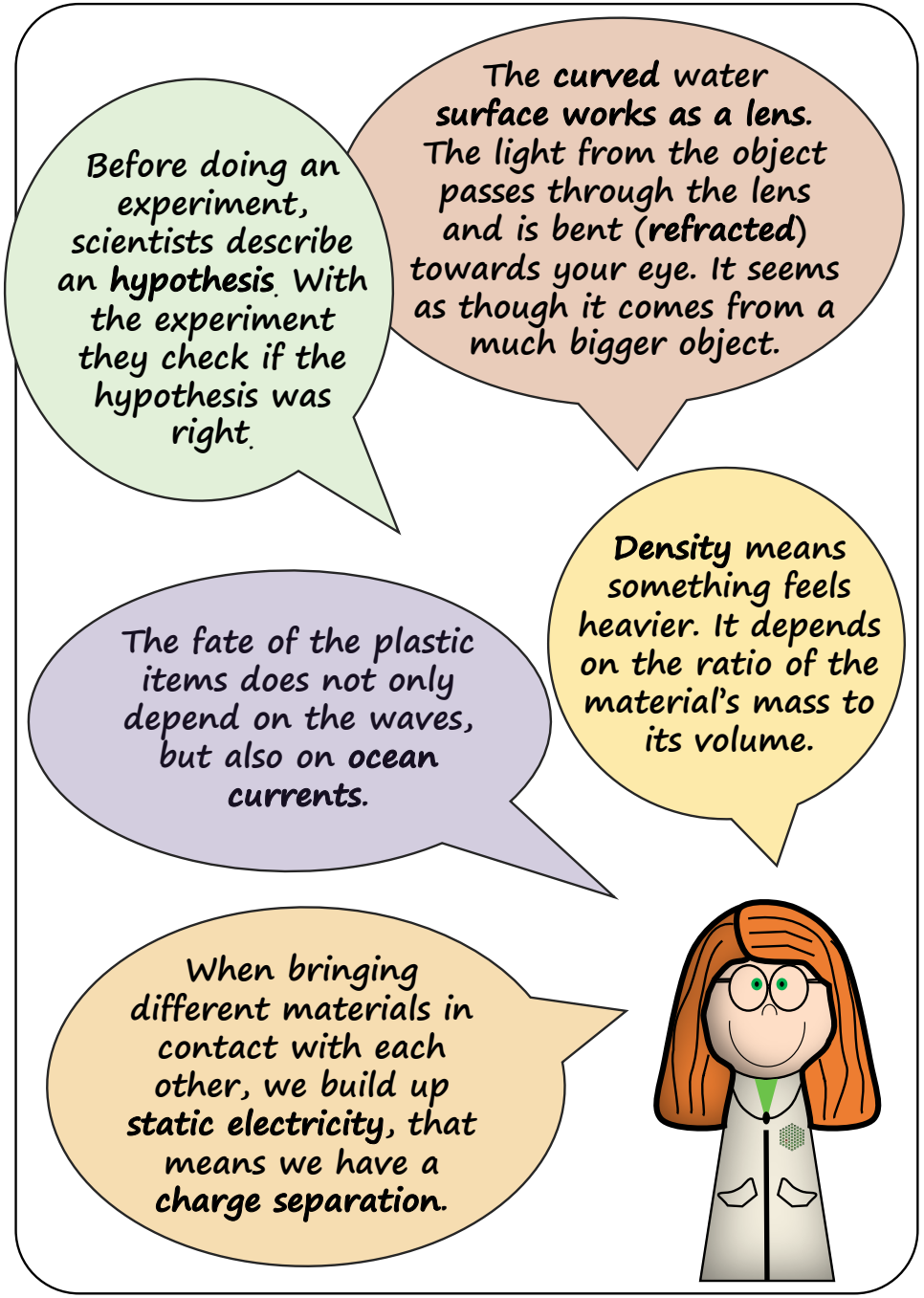


Do you have some ideas how to reduce plastic pollution?

My small steps
for clean oceans

EMBL

Can you draw some marine animals that live in the ocean? Remember plastic does not belong in their homes.



Credits

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Dmitri Modensky

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Inspiration taken from
https://plasticsoep.sites.uu.nl, /www.mathtutordvd.com
www.plasticsoupfoundation.org,
https://sugarspiceandglitter.com, www.sequoiascience.com
https://iswitch.com.sg/fun-static-electricity-home-experiments
https://www.yourtherapysource.com/mosaicfree.html

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