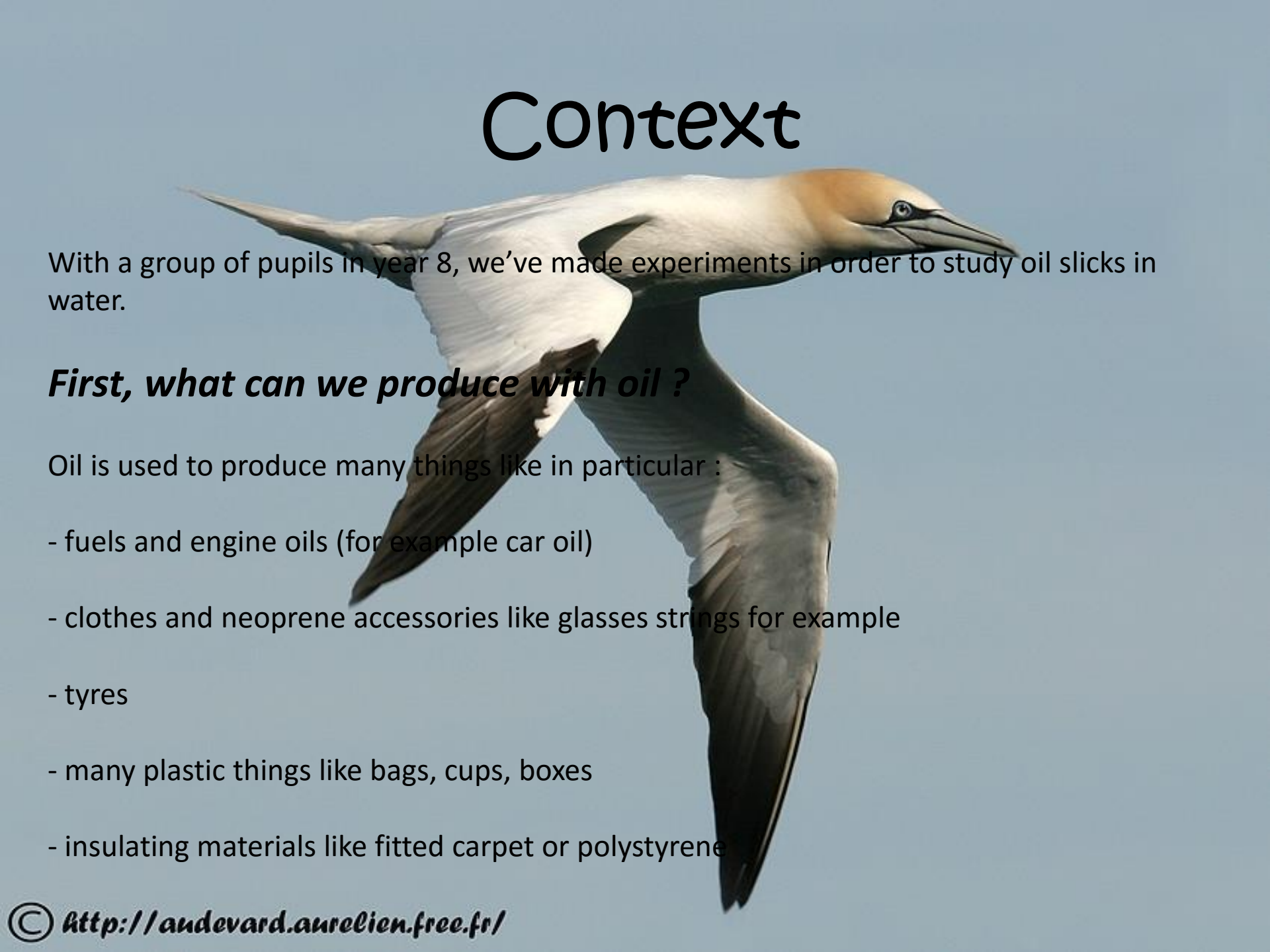
Petroleum and oil slicks

Éducation et culture
Éducation et formation tout au long de la vie
COMENIUS

Collège Saint Anne PLOUGASTEL DAOULAS

Context



With a group of pupils in year 8, we've made experiments in order to study oil slicks in water.

First, what can we produce with oil ?

Oil is used to produce many things like in particular :

- fuels and engine oils (for example car oil)

- clothes and neoprene accessories like glasses strings for example

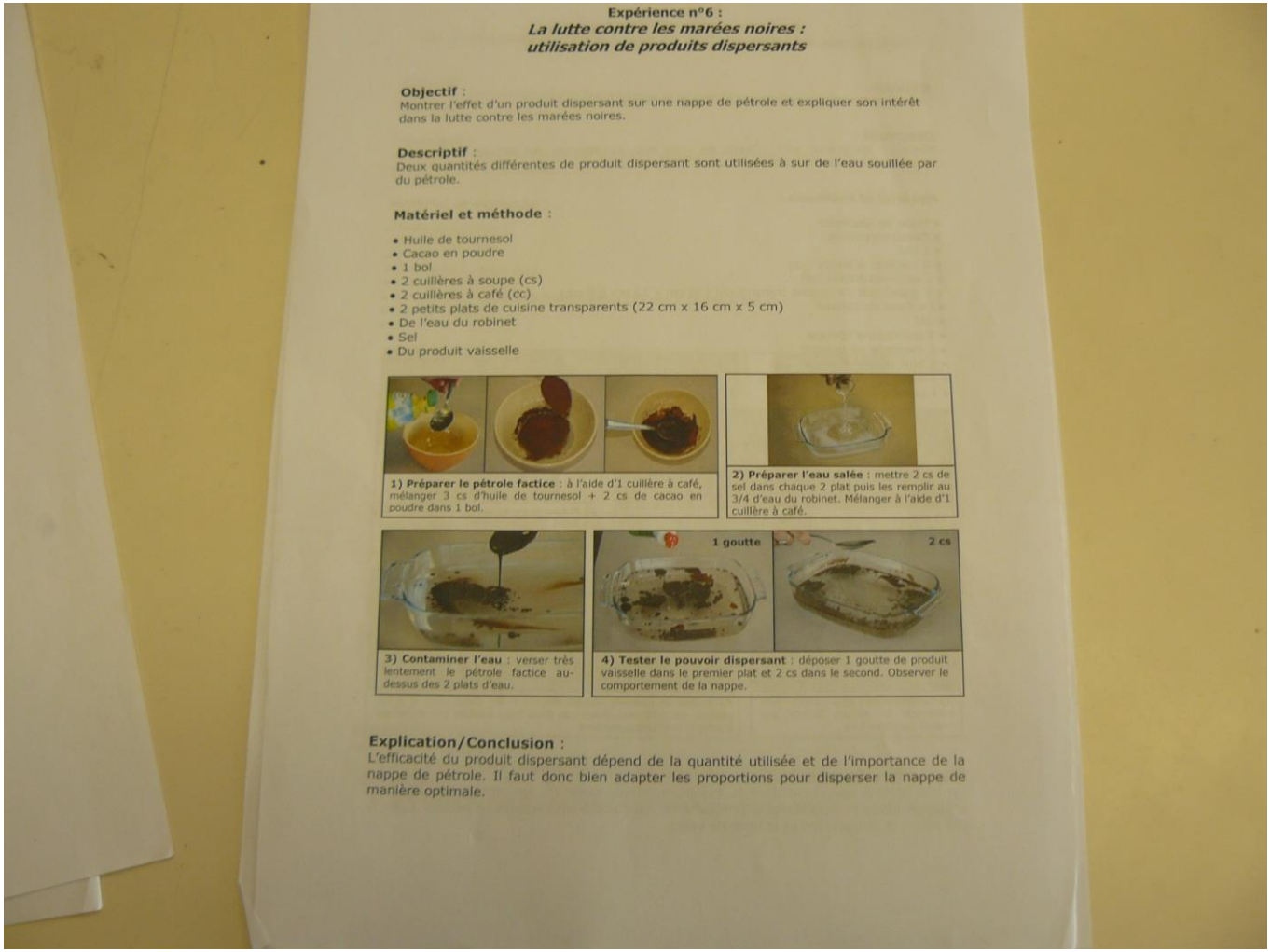
- tyres

- many plastic things like bags, cups, boxes

- insulating materials like fitted carpet or polystyrene

We have made our experiments in the Physics lab.

We've followed protocoles that were given to us by the CEDRE which is an information, research and experimentation Center located in Brest.



Expérience n°6 :

La lutte contre les marées noires : utilisation de produits dispersants

Objectif :
Montrer l'effet d'un produit dispersant sur une nappe de pétrole et expliquer son intérêt dans la lutte contre les marées noires.

Descriptif :
Deux quantités différentes de produit dispersant sont utilisées à sur de l'eau souillée par du pétrole.

Matériel et méthode :

- Huile de tournesol
- Cacao en poudre
- 1 bol
- 2 cuillères à soupe (cs)
- 2 cuillères à café (cc)
- 2 petits plats de cuisine transparents (22 cm x 16 cm x 5 cm)
- De l'eau du robinet
- Sel
- Du produit vaisselle

1) Préparer le pétrole factice : à l'aide d'1 cuillère à café, mélanger 3 cs d'huile de tournesol + 2 cs de cacao en poudre dans 1 bol.

2) Préparer l'eau salée : mettre 2 cs de sel dans chaque 2 plat puis les remplir au 3/4 d'eau du robinet. Mélanger à l'aide d'1 cuillère à café.

3) Contaminer l'eau : verser très lentement le pétrole factice au-dessus des 2 plats d'eau.

1 goutte

2 cs

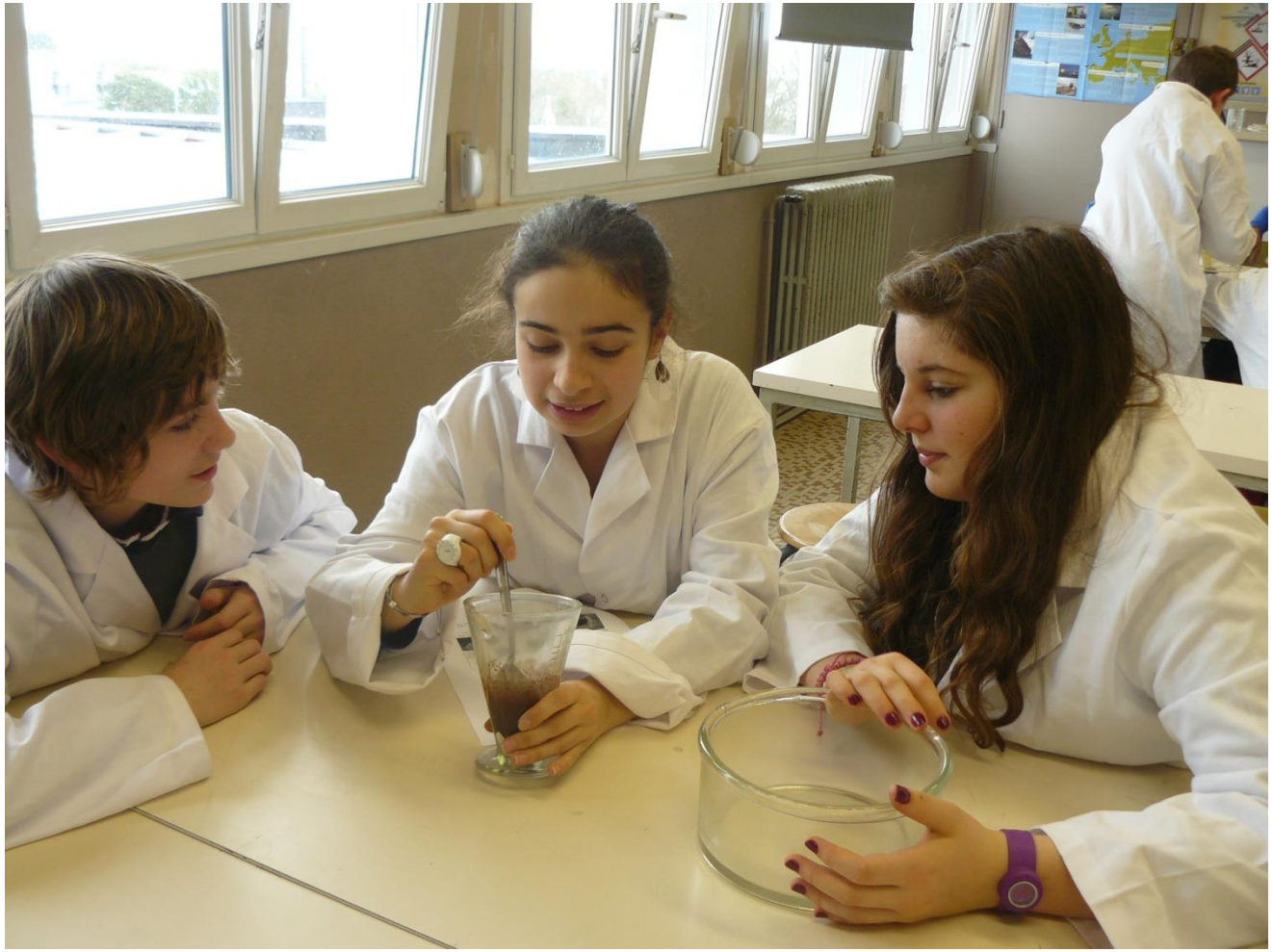
4) Tester le pouvoir dispersant : déposer 1 goutte de produit vaisselle dans le premier plat et 2 cs dans le second. Observer le comportement de la nappe.

Explication/Conclusion :
L'efficacité du produit dispersant dépend de la quantité utilisée et de l'importance de la nappe de pétrole. Il faut donc bien adapter les proportions pour disperser la nappe de manière optimale.

The first step was the preparation of the artificial oil slick.

To do so, we've mixed 3 tablespoons of sunflower oil with 2 teaspoons of cocoa powder in a stemmed glass.

The first group has tested the use of absorbent products to fight against oil slicks.



Another group has showed the effects caused by oil-polluted water on seabirds' feathers.

The third group has tested the reaction of oil in fresh water and in sea water.

Now let us show you the experiments :
Here, the pupils are dipping a feather in some clear water and another one in some oil-polluted water.


Océanopolis

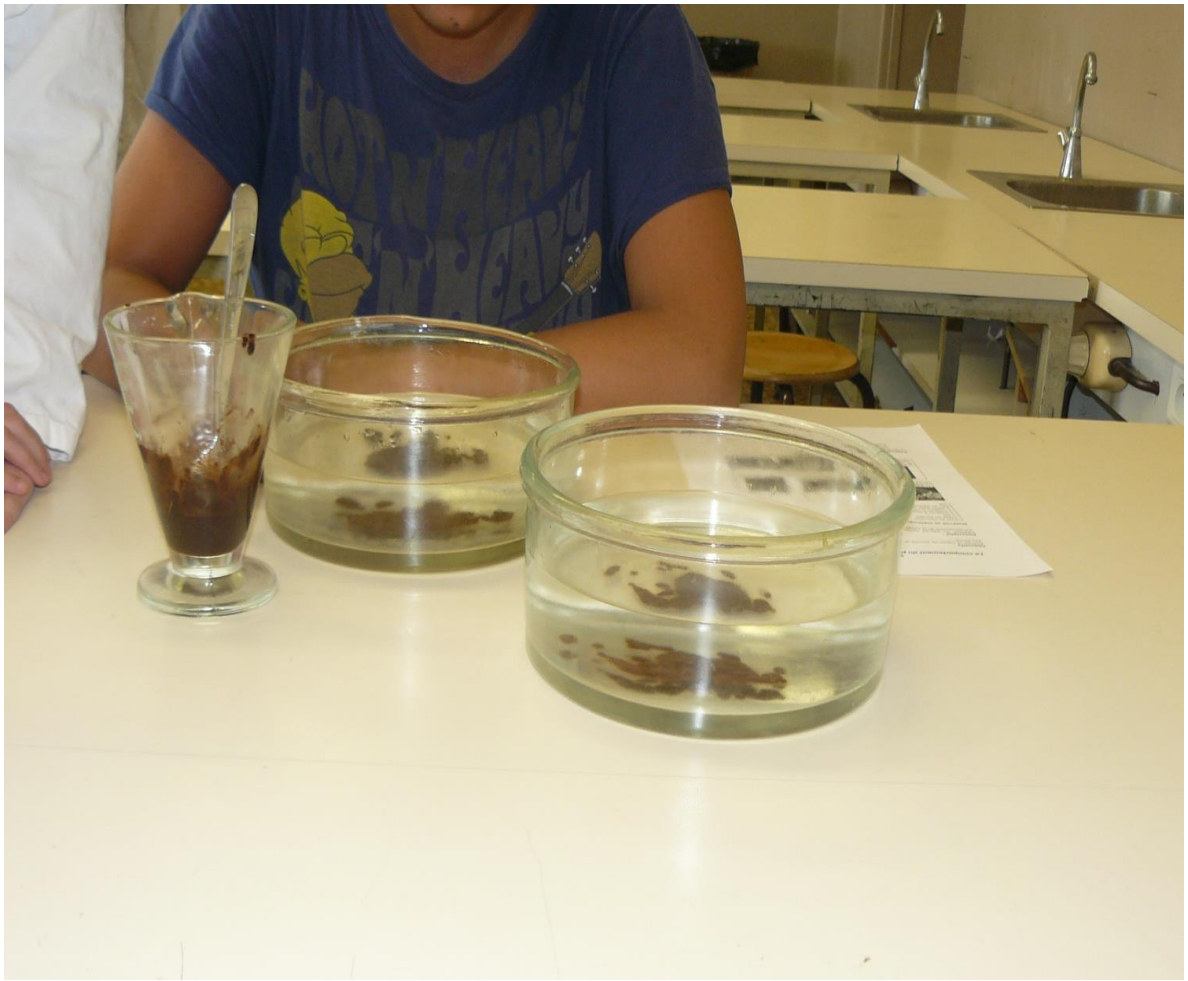
What we notice is that oil sticks to the feathers and doing so, they get heavier and lose part of their insulating power.
Then, it becomes more and more difficult for the birds to float, fly and keep their body temperature. They often die from hypothermia or drowning.

Here we've studied the notion of DENSITY. We've clearly noticed that oil floats in sea water but that it sinks in fresh water.

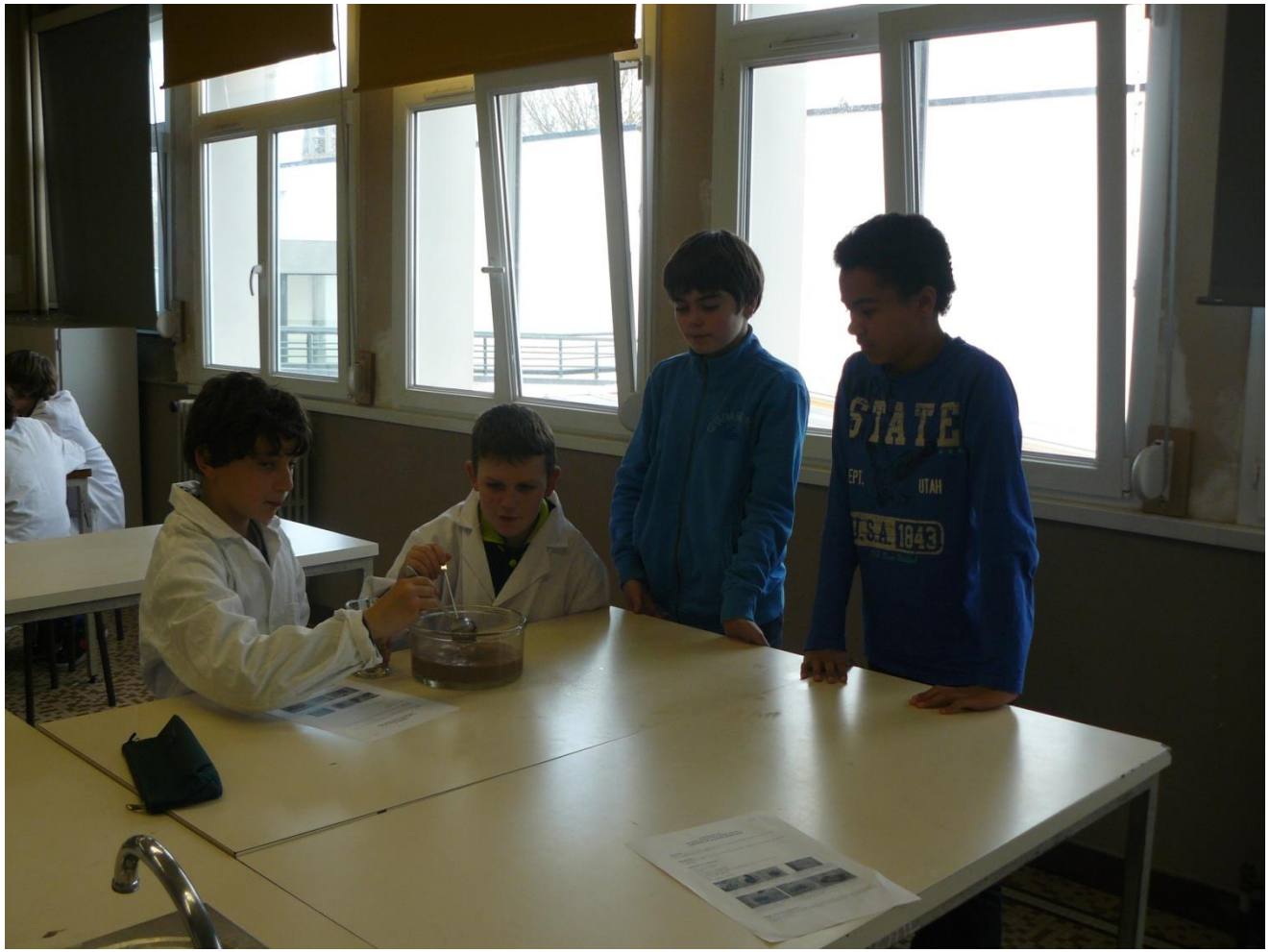
The density of oil is :

- lower than the density of sea water, that's why it can float on salted water

- higher than the density of fresh water, that's why it sinks in water taken from the tap .



Here we are observing the effect of a dispersive product on an oil so as to be able to explain why it can be useful to fight against oil slicks.




Produits chimiques
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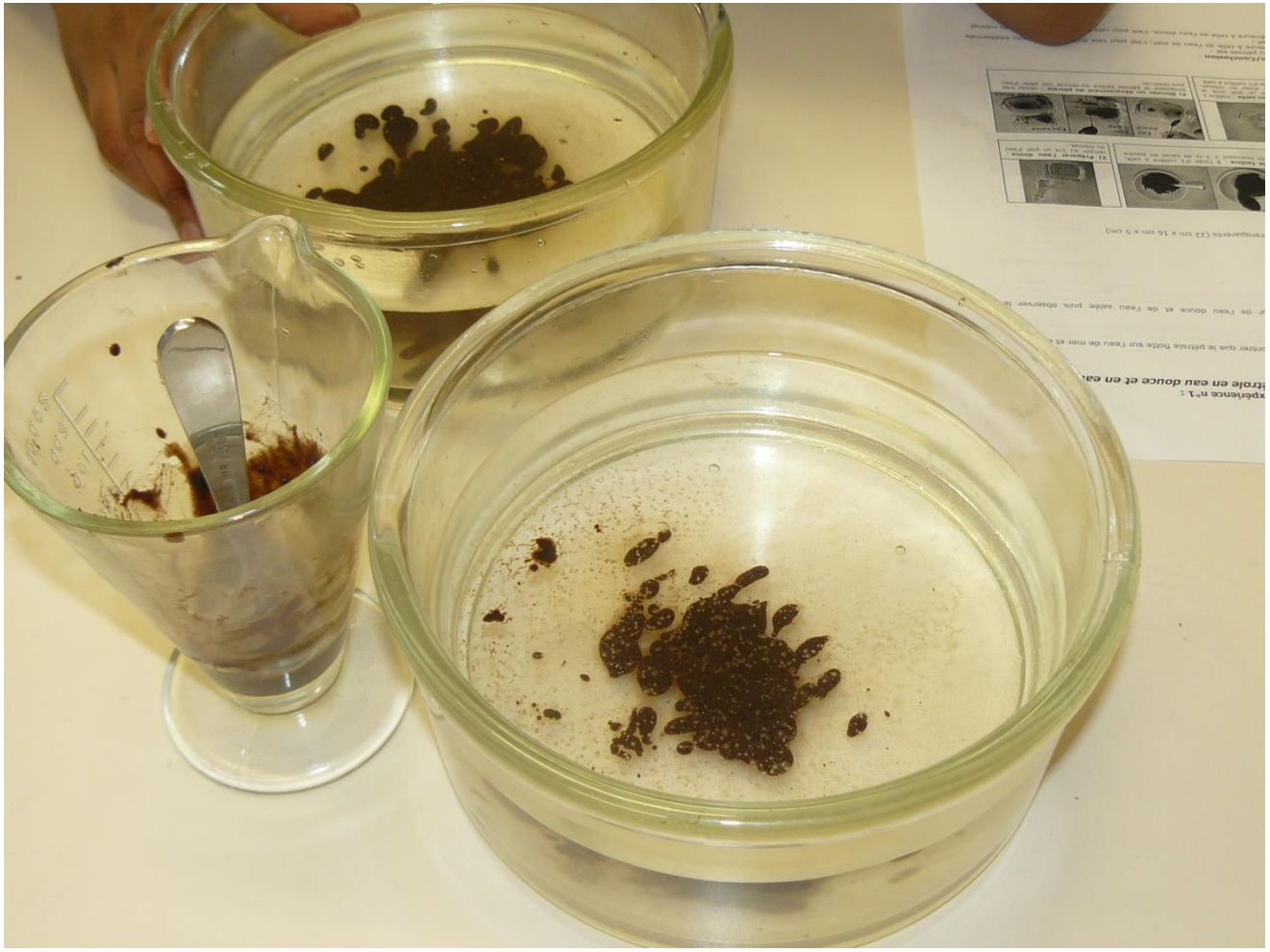
We can notice that the effectiveness of the dispersive product depends on the quantity used and also on the importance of the oil slick.

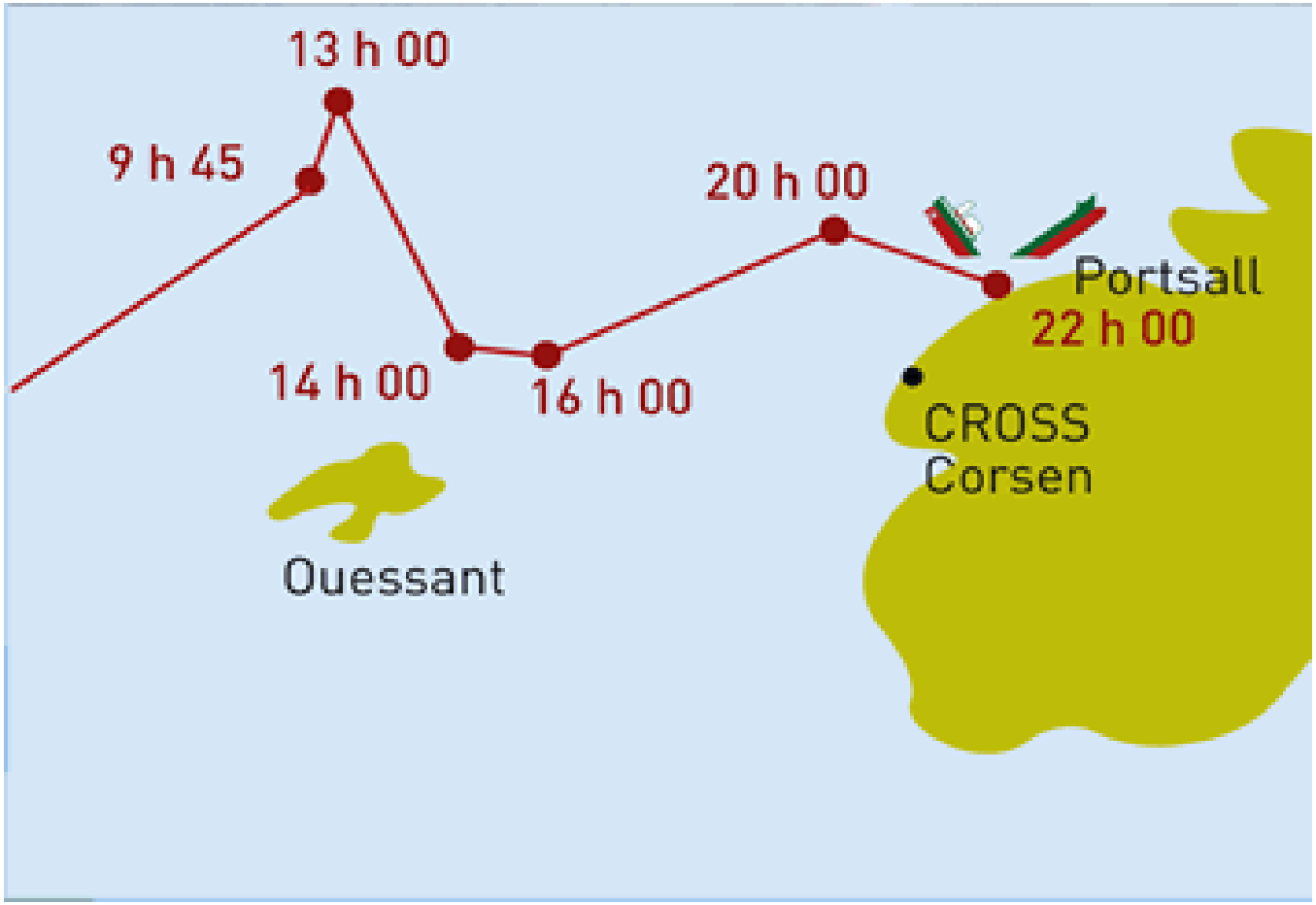


In this group we're showing the effects of absorbing products on oil slicks.

A good absorbent product in the case of an oil slick is a product that has the capacity to fix oil in presence of water and oil.
That is the case for polystyrene and glass wool.

Today there are some alternatives to the use of oil in industry but yet, great steps are still to be made to avoid ecological disasters…

like the one we had to face with the oil tanker « Amococadiz » in 1978.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THE AMOCO CADIZ

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