Plankton – going down slowly - always
Experiment 1

In this experiment we will investigate the influence of **shape** on the sinking behaviour of plankton.
We let models of plankton sink in a viscous liquid (sugar solution, glycerol, or motor oil) and compare it with a ball of the same weight and the same material.

Material: Plankton sample, microscope, lumps of plasticine (2 g), high glass cylinder (e.g. measuring cylinder 1000 ml) with two marks (distance 30 cm), stop watch, metal sieve, sugar solution (66%), glycerol (99%) or motor oil

Method:

1. Examine a plankton sample with the microscope!
2. Model one of the observed algae from a plasticine lump!
3. Form a ball from a second plasticine lump!
4. Fill the liquid into the cylinder, place the sieve in it and let the ball fall into the cylinder! Aim for the centre of the surface!
5. Measure the time the object needs to sink from the first to the second mark
6. Retrieve the object from the cylinder with the sieve!
7. Repeat the experiment 4 times, calculate the average sinking time and the average sinking velocity (sinking distance = 0.3 m)!
8. Repeat the experiment with your "alga"!

	sinking time (ball) (s)	*sinking time (alga) (s)*
exp. 1		
exp. 2		
exp. 3		
exp. 4		
exp. 5		
average		
sinking velocity v(m/s)		

Questions:

1. What is the sinking quotient of the your "alga"?
   Calculate the sinking quotient by dividing the sinking velocity of the "alga" by the sinking velocity of the ball! The sinking quotient tells you how slow an alga sinks compared to a ball of the same volume.

2. Now you can explain how plankton benefits from its often bizarre shapes:

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Experiment 2

With this experiment we will investigate the influence of **temperature** on the sinking behaviour of algae.

Material: algae models used in experiment 1, glass cylinder (as in experiment 1), stop watch, thermometre, solutions used in experiment 1 a) from refrigerator, b) at room temperature, and c) from water bath (at 45 °C)

Method:

1. Measure the temperature of the liquid from the refrigerator (a)!
2. Drop the "alga" into the cylinder! Aim for the centre of the surface!
3. Measure the time the object needs to sink from the first to the second mark!
4. Repeat the experiment 4 times, calculate the average of the sinking time and the sinking velocity (sinking distance = 0.3 m)!
5. Repeat the whole experiment with the liquid at room temperature (b) and the warm liquid (c)!

	sinking time at... °C (s)	*sinking time at ... °C (s)*	*sinking time at... °C (s)*
exp. 1			
exp. 2			
exp. 3			
exp. 4			
exp. 5			
average			
sinking velocity v (m/s)			

Questions:

1. What is the influence of the temperature on the sinking behaviour?

2. What happens to those algae which come into contact with the cold thermocline during the summer?