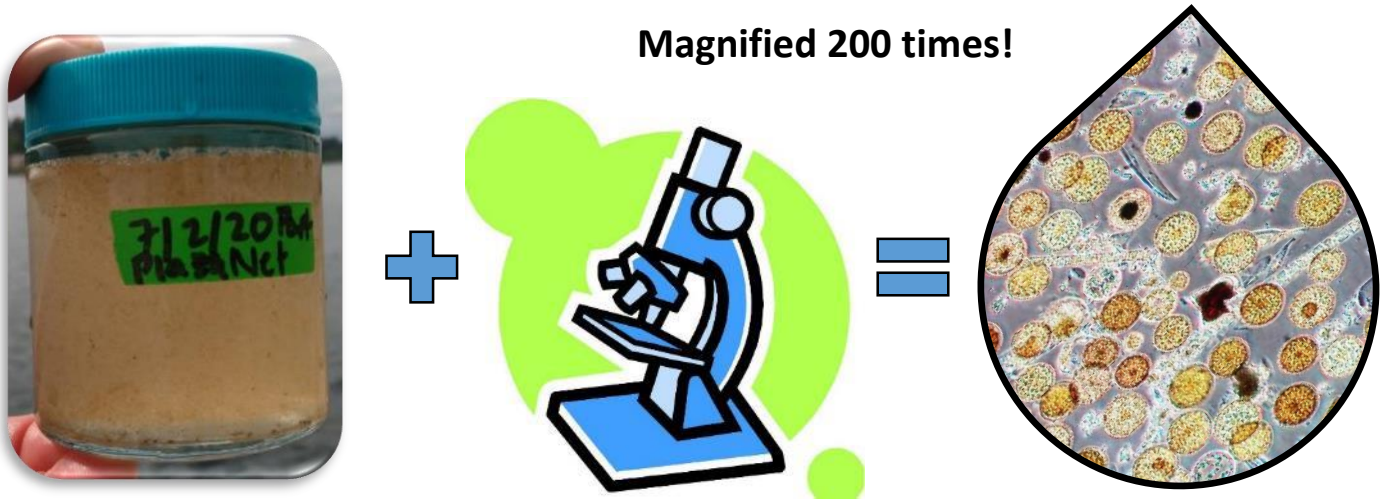
Microscopic World of Plankton – What's Blooming in Budd?

Did you know that every drop of Puget Sound water is teeming with microscopic life? Welcome to the exciting world of plankton – the drifters of the sea! While tiny in size, these mostly microscopic animals (**zooplankton**) and plant-like organisms (**phytoplankton**) are incredibly important! They are food for many marine creatures – plankton soup! – with phytoplankton being eaten by zooplankton which are eaten by small fish and on up the food web. Phytoplankton also produce over half of the oxygen that we breathe through photosynthesis! Thank you phytoplankton!



Each summer, scientists collect data from Budd Inlet to give us clues about local water quality. They use an instrument called a YSI to measure temperature, salinity, pH, and dissolved oxygen; and a special net to collect plankton. **Be a scientist and use the following graph template to plot this summer's water temperature and oxygen data. Then, for each week, cut and paste, or sketch, one of the plankton species that was common in the net tow.** How did temperature, oxygen, and phytoplankton change throughout the summer in Budd Inlet? Let's find out!

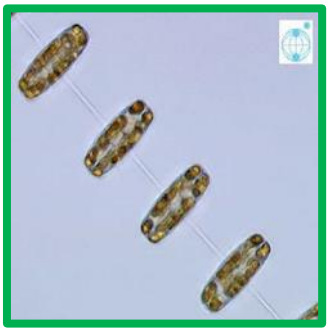
2020 Budd Inlet	6/4	6/18	7/2	7/16	7/30
Temperature (°C)	12.0	12.1	12.5	13.0	13.9
Oxygen (mg/l)	10.7	7.4	6.6	4.6	5.4
Plankton	*Skeletonema*	*Heterocapsa*	*Noctiluca*	*Noctiluca*	*Akashiwo*
	Chaetoceros	*Scrippsiella*	*Pseudo-nitzschia*	*Akashiwo*	*Dinophysis*
	Thalassiosira	*Protoperidinium*	*Rotifers*	*Pseudo-nitzschia*	*Protoceratium*

Pacific Shellfish Institute

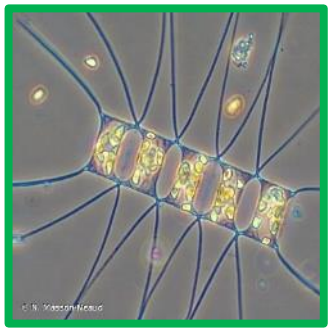
To find data and photos from the entire summer, visit www.pacshell.org/whats-blooming-in-budd.asp.

Skeletonema (1)

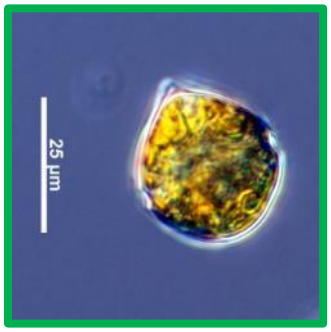
Thalassiosira (2)



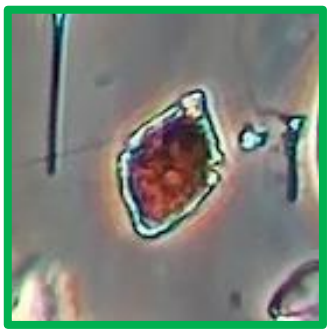
Chaetoceros (3)



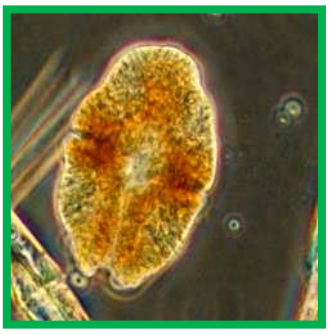
Scrippsiella (4)



Heterocapsa (5)

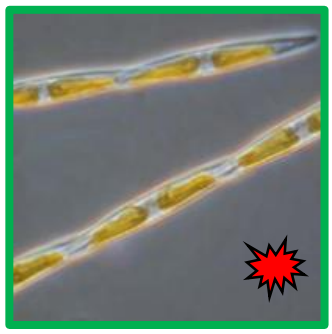


Akashiwo (6)

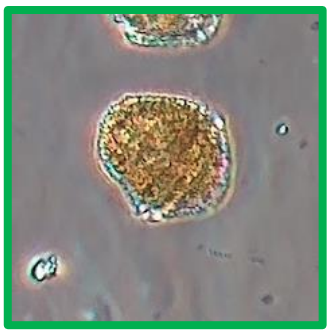


Rotifers (7)

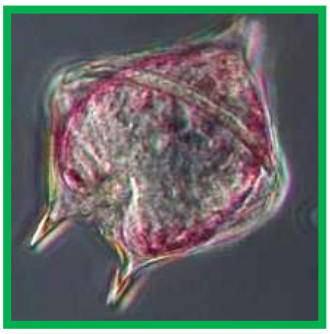
Pseudo-nitzschia (8)



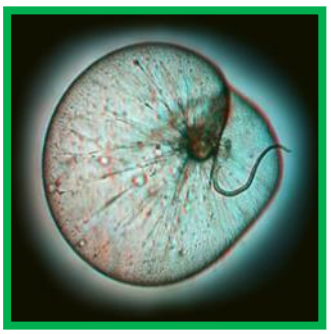
Protoceratium (9)



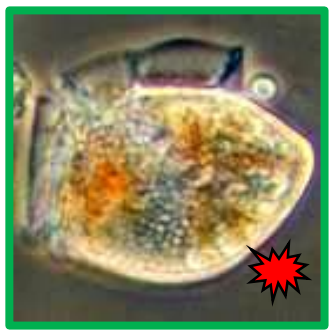
Protoperidinium (10)



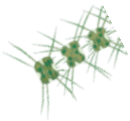
Noctiluca (11)



Dinophysis (12)



These plankton were all common in this summer's water samples. They include a mixture of phytoplankton (diatoms & dinoflagellates), and zooplankton.



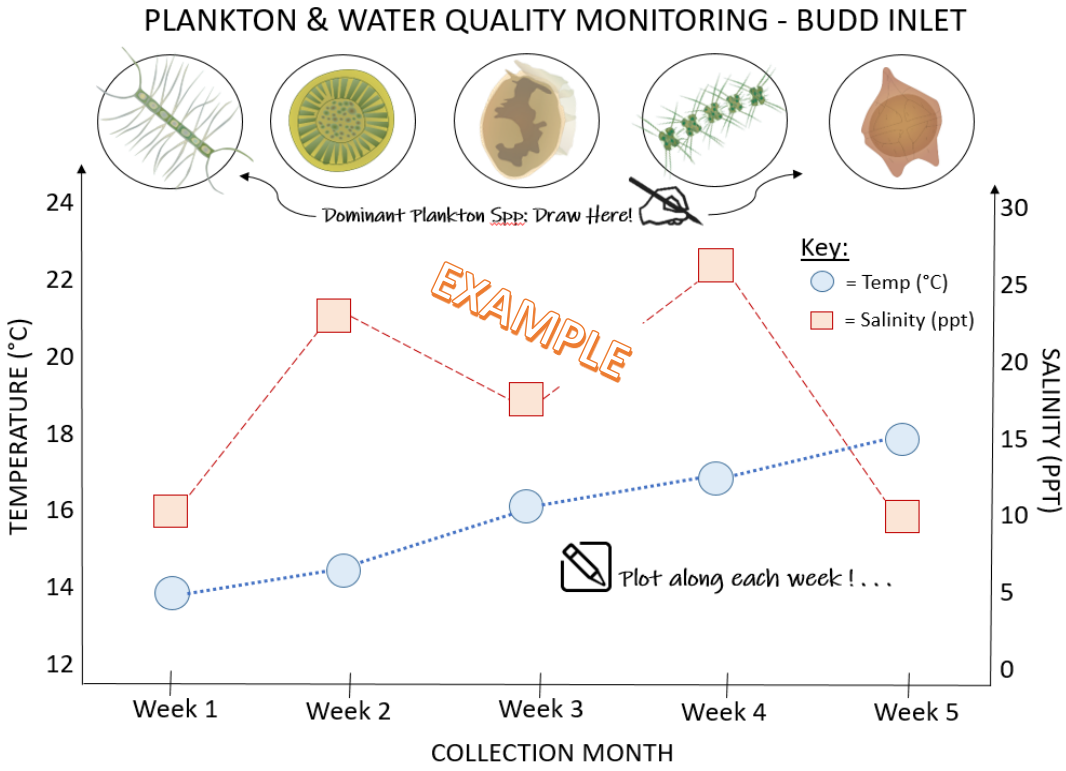
Diatoms often link up in long chains to help them remain in sunny surface water where they can photosynthesize. They are common during the spring BLOOM.

Dinoflagellates have 2 whip-like flagellas (not visible in these photos) that help them "swim" up and down in the water column. Like diatoms, they photosynthesize and are most common during mid-late summer.

Zooplankton are mostly microscopic animals. Some remain zooplankton their whole life while others become invertebrates like clams and crab that you find on the beach.

Harmful Algal Bloom species, or HABs, are phytoplankton that can sometimes produce powerful bio-toxins that accumulate in shellfish and fish and make them harmful, even deadly, to mammals (including us!) when eaten.

Follow the EXAMPLE to plot this summer's temperature, oxygen, and phytoplankton data. Then, answer the following questions…



1. Can you find 4 **diatoms** from the collection of plankton photos? Write the name or number.

2. Can you find 7 **dinoflagellates**?

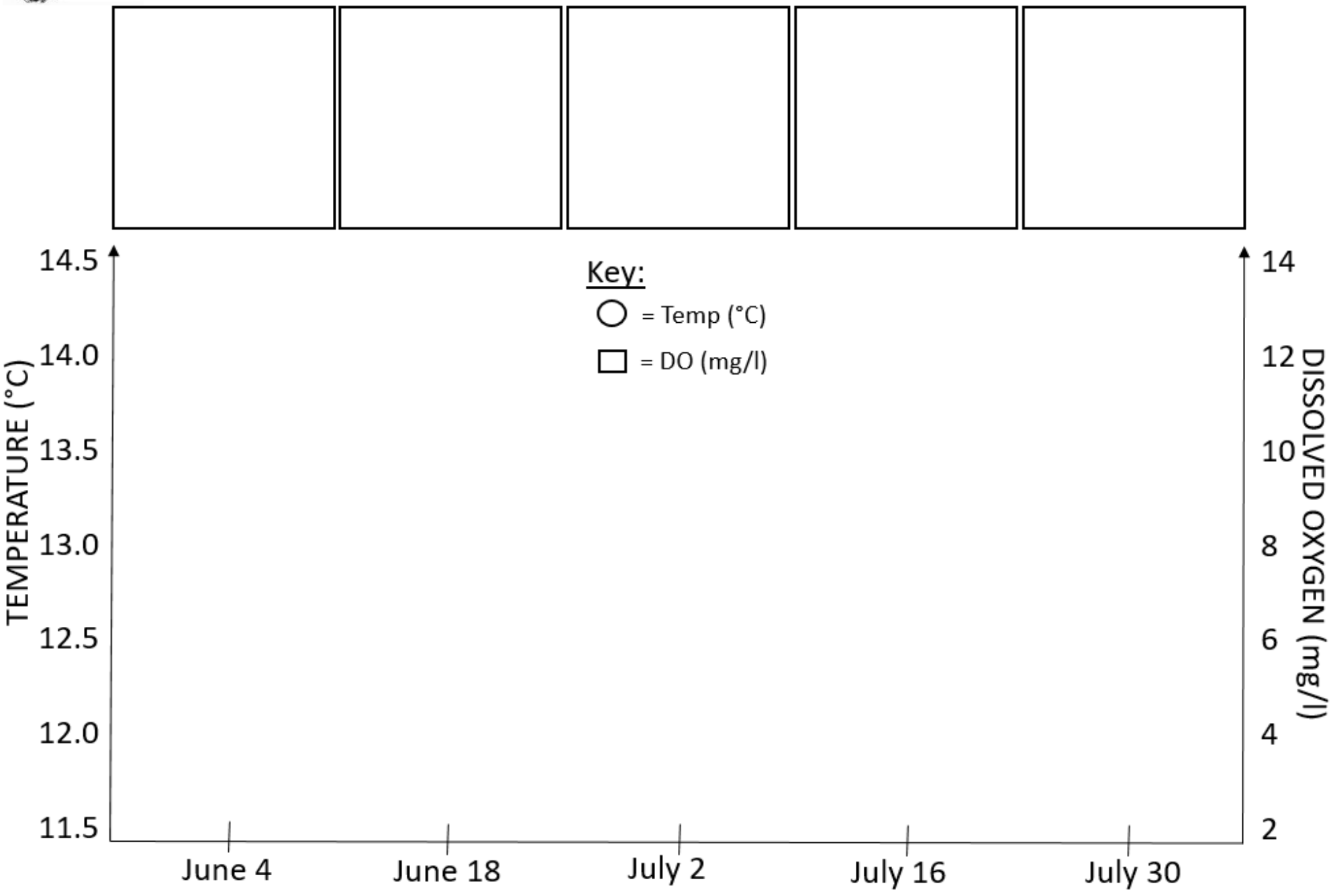
3. Can you find 1 **zooplankton**?

4. Did **temperature** increase or decrease from June to July? Why?

5. Did **dissolved oxygen** increase or decrease from June to July? Why?

Pacific Shellfish Institute

PLANKTON & WATER QUALITY MONITORING - BUDD INLET



ANSWER KEY

1. Can you find 4 **diatoms** from the collection of plankton photos? Write the name or number.

   1, 2, 3, 8

2. Can you find 7 **dinoflagellates**?

   4, 5, 6, 9, 10, 11, 12

3. Can you find 1 **zooplankton**?

   7

4. Did **temperature** increase or decrease from June to July?

   *Temperature **increased**. As the days grew warmer, so did water temperature. These data were collected at a 3-meter depth, or about 10 feet down. Do you think the temperature was warmer or cooler at the surface? Warmer! For example, on 7/30, the surface was warmed by the sun's rays (20.8°C or 69°F) but remained cooler at depth (13.9°C) where solar radiation didn't penetrate as far.*

5. Did **dissolved oxygen** increase or decrease from June to July?

   *Dissolved oxygen **decreased**. During June, phytoplankton BLOOMED, or multiplied quickly. After all, they had everything they needed to grow: nutrients and sunlight! As they photosynthesized, they produced a lot of oxygen. By July, many of these cells had died and sunk to the bottom of the Inlet where they were decomposed, or broken down, by bacteria. Bacteria use oxygen (like us!), so when they are hard at work, oxygen levels drop near the bottom. Like people, aquatic organisms need oxygen to survive. Oxygen levels below 5 mg/l can be stressful for marine life.*