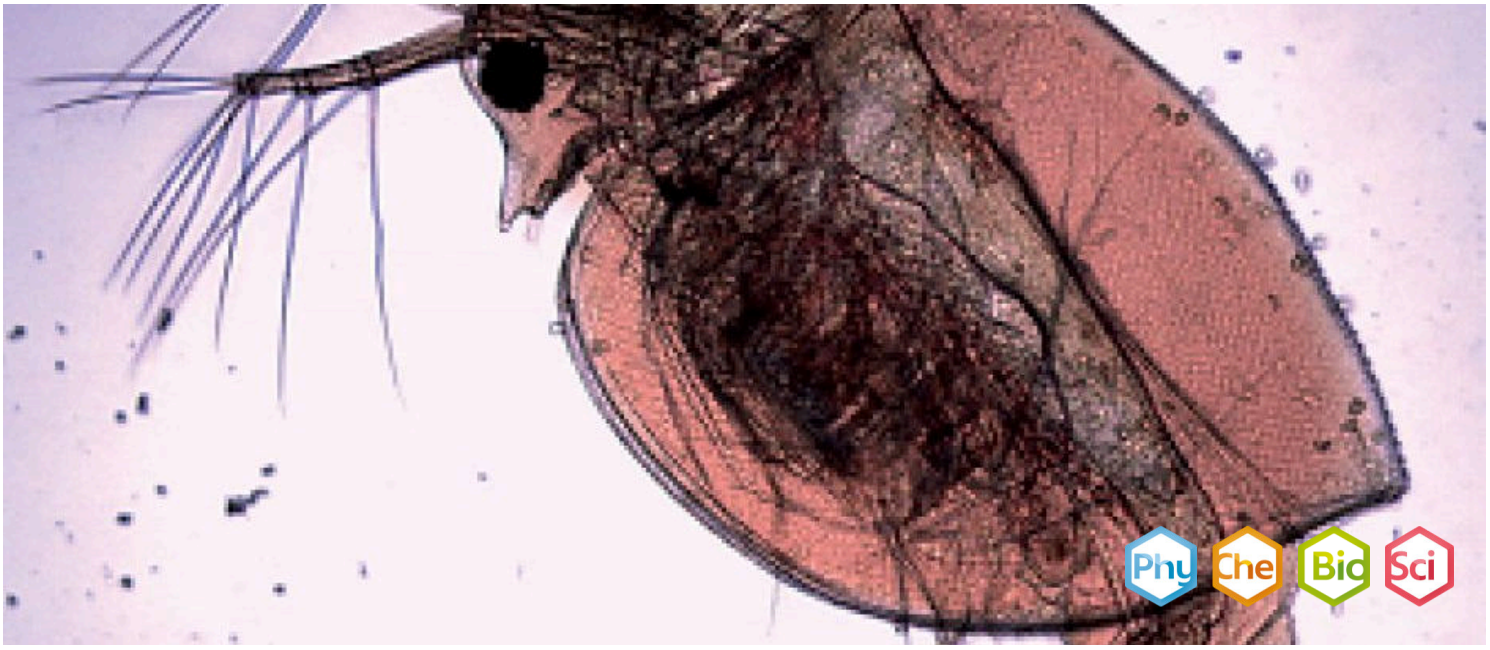
Water flea



Biology	Microscopy / Cell Biology	Basics of Microscopy & Work Technology
Biology	Animal Physiology / Zoology	Invertebrates
Nature & technology	From the very small & the very big	
Nature & technology	Plants & animals	

Difficulty level	Group size	Preparation time	Execution time
easy	1	10 minutes	30 minutes

This content can also be found online at:

http://localhost:1337/c/6127580a870bca000351f8cd

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Teacher information

Application

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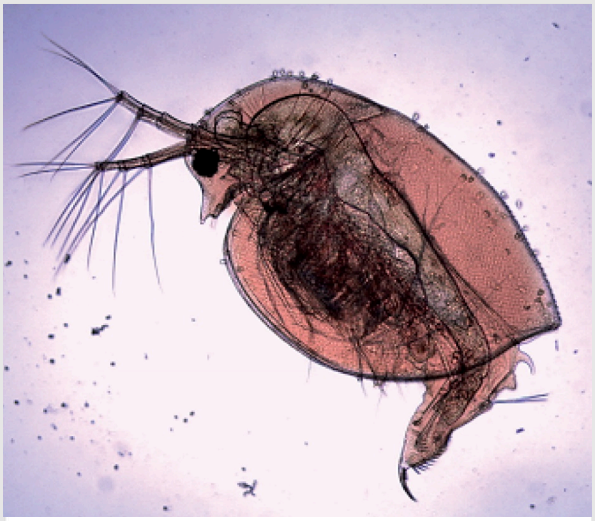

Water flea 40x

Water fleas are not fleas, but belong like the brine shrimp to the gill-foot crabs. Water fleas are 0.8 -1.5 mm in size and can therefore be seen with the naked eye. Since they reproduce mainly parthenogenetically, we find almost exclusively females carrying unfertilized eggs and embryos in the dorsal cavity.

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Other teacher information (1/4)

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Prior knowledge

Students should have a good background knowledge of water fleas and be familiar with their structure. They should also be familiar with the use of a microscope.

Scientific Principle

Students look at water fleas under the microscope.

Other teacher information (2/4)

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Learning objective

Students should be able to name the structure of water fleas and observe the heartbeat as a function of temperature.

Tasks

The students should look at water fleas with a magnifying glass and a microscope. They should pay special attention to the structure and the heartbeat.

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Other teacher information (3/4)

Notes on material procurement

Water fleas can be found in some standing waters or you can get them from the pet store where they are sold as fish food.

Water flea larva 40x

Other teacher information (4/4)

Notes on implementation

The movements of the water flea: The 2. pair of antennae is rebuilt to forked rudder-legs, with which the water-flea moves forward bumpily, almost hopping like a flea.

The physique

Eyes: You can clearly see the optic nerve (center) and the eye muscles (side).

Head: The head is helmet-like and looks beak-shaped in front.

The heart: The heart lies behind the intestine (in the direction of the back).

The oar legs (Antennae): They are jointed, forked and bear swimming bristles.

The heart rate: The number of heartbeats can be observed and counted extremely well. It is about 40 to 50 beats per minute at refrigerator temperature and 150 to 200 at room temperature. An average value can then be determined with the class.

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Safety instructions

- Working with microscopes for too long can lead to physical discomfort (fatigue, headache, nausea), especially when students are untrained.
- Microscopes are sensitive. During transport and handling, care should be taken to ensure that everything is done carefully and without rushing.
- The general instructions for safe experimentation in science lessons to be applied to this experiment.

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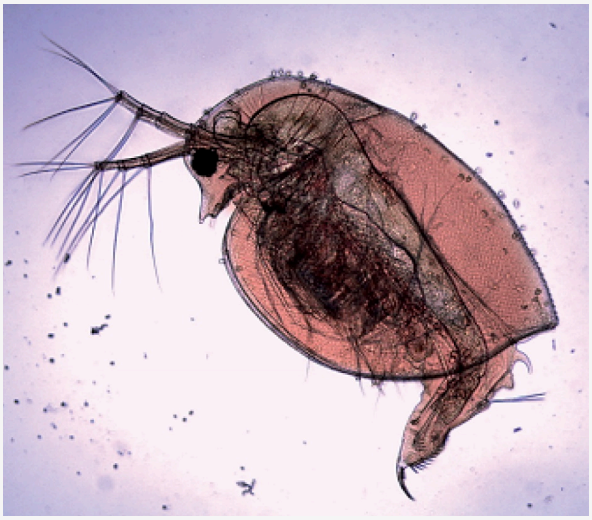
Student Information

Motivation



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Equipment

Position	Material	Item No.	Quantity
1	PHYWE Binocular student microscope, 1000x, mechanical stage	MIC-129A	1
2	Microscopic slides, 50 pcs	64691-00	1
3	Cover glasses 18x18 mm, 50 pcs	64685-00	1
4	Magnifier, plastic, 5x, d=35mm	88002-01	1
5	Beaker, 100 ml, plastic (PP)	36011-01	1
6	Dropping pipette with bulb, 10pcs	47131-01	1

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Procedure (1/2)

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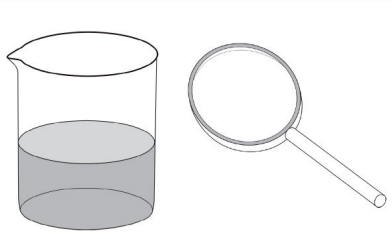
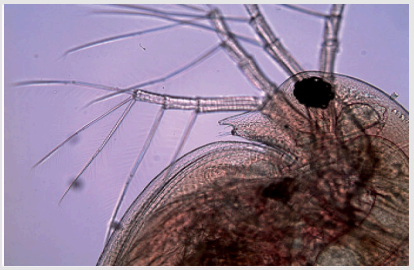
1. Observe and describe the movements of a water flea with a magnifying glass through a transparent water glass.



2. Examinate at lowest and medium magnification.

- Look at the eyes, the shape of the head and the antennae. Can you see the muscle strands and the optic nerve in the eye, as in the picture on the right?
- See if you can spot any embryos.



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Procedure (2/2)

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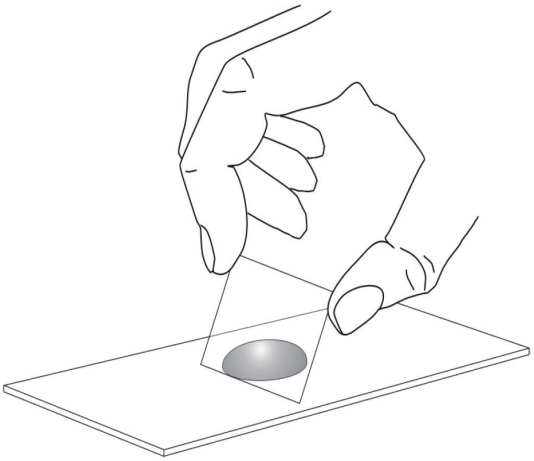
Examine the heart rate as a function of temperature!

For this study, you need water fleas that have been stored for a few hours in the refrigerator at approx. 6-8°C and those that have been stored at room temperature. Measure the number of heartbeats in 1 minute for at least three different water fleas! To get 6 measurement results, exchange your values with your neighbour. Then find the average values and compare them with the average values of the other students. The averages should be about the same for everyone.



Examine the heartbeat under the microscope

Report

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Task 1

Move the words to the right place.

The 2nd pair of antennae is transformed into forked _____, with which the water flea moves forward bumpily, almost hopping like a flea. They are _____, forked, and bear swimming bristles.
The number of heartbeats can be observed and counted extremely well. It is about _____ beats per minute at refrigerator temperature and _____ at room temperature.

40 to 50
150 to 200
articulated
rudder legs

Check

Task 2

The heart lies in front of the intestine (in the direction of the back).

○ True ○ Incorrect

Check

Water fleas are 0.8 -1.5 mm in size and can be seen with the naked eye. They are not fleas but belong to the gill-foot crabs.

○ True ○ Incorrect

Check

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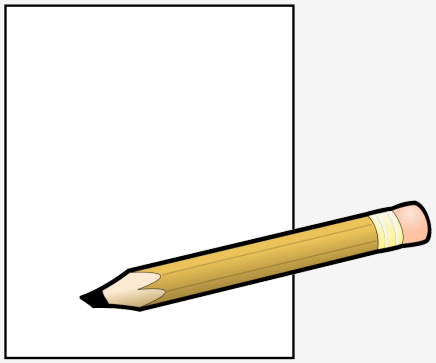
Task 3

Draw a water flea and try to label eyes, head, antennae, heart, intestines, and embryos if available.



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