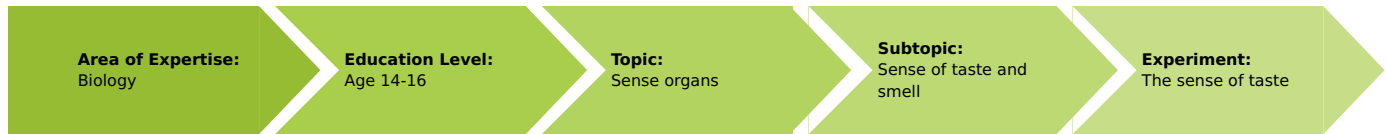


# The sense of taste (Item No.: P8013600)

## Curricular Relevance



### Difficulty



Easy

### Preparation Time



10 Minutes

### Execution Time



10 Minutes

### Recommended Group Size



2 Students

### Additional Requirements:

- Refined sugar
- Wine vinegar

### Experiment Variations:

### Keywords:

Taste buds, Taste receptors

## Task and equipment

### Information for teachers

### Additional Information

The sense of taste is a complex sensation, caused by a combination of smell, taste as well as tactile sense, temperature and pain.

The taste, which we perceive, is created very similar to the sensation of smell: On the surface of our tongue are taste buds, in which taste receptors are embedded, which are activated by special substances in our food. When the taste receptors are activated, a stimulus is produced, which is relayed to the brain and there creates (together with other stimuli) the sensation of taste.

At present, taste receptors for five different tastes (or taste qualities) are known: sweet, sour, bitter, salt and umami.

Not every region of the tongue is sensitive, but each taste-sensitive region can perceive all taste qualities (otherwise, as assumed before). However, some taste qualities are more noticeable in certain areas of the tongue than in others, so the taste "sweet" is perceived stronger on the tip of the tongue while "bitter" is experienced more intensely on the back of the tongue.

### Hints on Set-up and Action

- It is important to ensure that the used material is completely clean. If necessary, the material has to be cleaned again or it has to be replaced.

# The sense of taste (Item No.: P8013600)

## Task and equipment

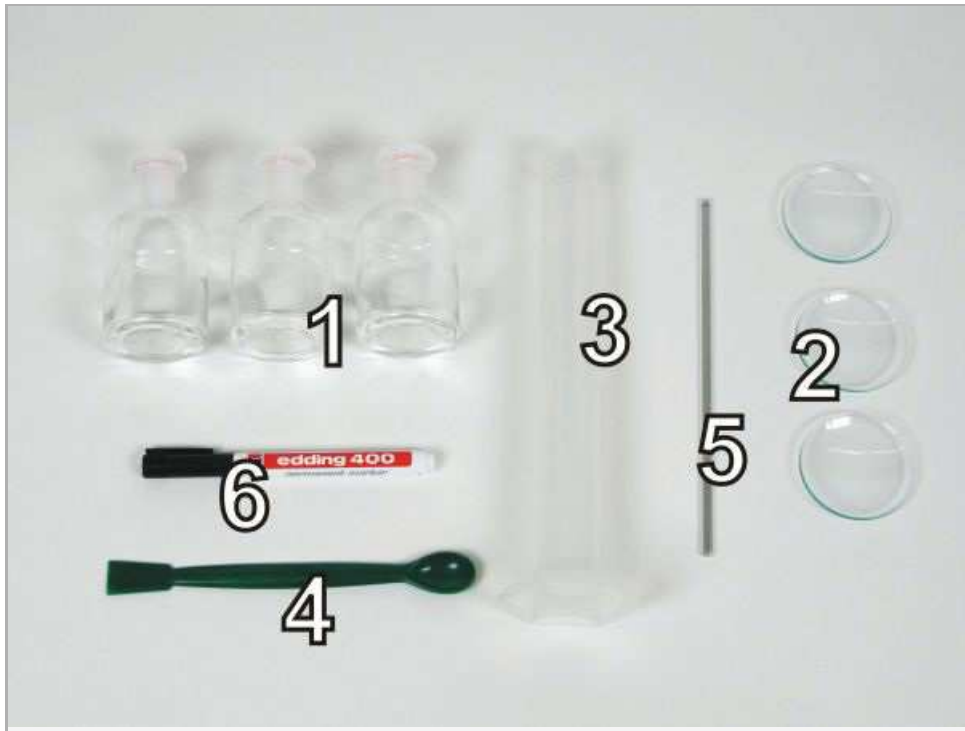
### Task

#### Can we taste with the whole surface of the tongue?

Examine on which parts of the tongue the various tastes are perceived.



Equipment



Position No.	Material	Order No.	Quantity
1	Bottle,nar.mouth,100ml,clear,p.st	41101-01	3
2	Watch glass, dia.60 mm	34570-00	3
3	Graduated cylinder 100 ml, PP transparent	36629-01	1
4	Spoon,w.spatula end,18 cm,plastic	38833-00	1
5	Glass rod,boro 3.3,l=200mm, d=5mm	40485-03	1
6	Labor pencil, waterproof	38711-00	1
	Portable Balance, OHAUS JE120	48895-00	1
	Sodium chloride, 500 g	30155-50	1
	Quinine hydrochloride 10 g	31196-03	1
	Water, distilled 5 l	31246-81	1
Additional material			
	Refined sugar		
	Wine vinegar		

## Set-up and procedure

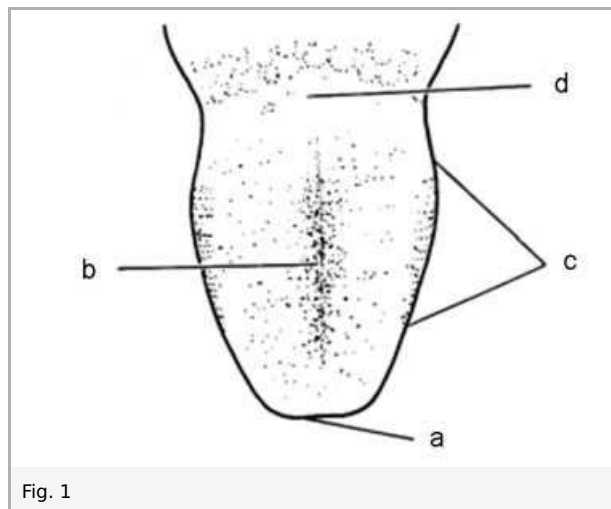
First of all, prepare the following solutions:

- Prepare the 30 % sugar solution by weighing 15 g of sugar on a watch glass, giving the sugar into a bottle and adding 35 ml (35 g) of distilled water.
- Prepare the 2 % quinine solution by weighing 1 g of quinine (Chininhydrochlorid-dihydrat) on a watch glass, giving the quinine into a bottle and adding 49 ml (49 g) of distilled water.
- Prepare the 15 % sodium chloride solution by weighing 7.5 g of sodium chloride on a watch glass, giving the sodium chloride into a bottle and adding 42.5 ml (42.5 g) of distilled water.

Shake all solutions until the solids have dissolved completely.

Dry the surface of your tongue with a clean handkerchief.

Stretch your tongue out as far as you can and get a school friend to place a drop of 30% sugar solution successively on the tip (a), middle (b), edge (c) and back (d) (see Fig. 1).



Repeat the experiment with vinegar, 2 % quinine solution and 15 % table salt solution in succession.

Write down your observations in the report.

## Report: The sense of taste

### Result - Observations

Note down your observations. On which parts of the tongue is the taste particularly intense? Are all tastes on all parts of the tongue of the same intensity?

.....

.....

.....

.....

### Evaluation - Question 1

On which parts of the tongue it is possible to state with certainty that the taste of each of the various substances has been experienced?

.....

.....

.....

.....

### Evaluation - Question 2

How is the sensibility for the four examined taste qualities distributed? Which areas of the tongue are especially sensitive to the different taste qualities?

.....

.....

.....

.....

### Evaluation - Question 3

Draw a sketch of the tongue's surface and label the areas, on which the sensations of "sweet", "sour", "bitter" or "salt" are particularly intense.