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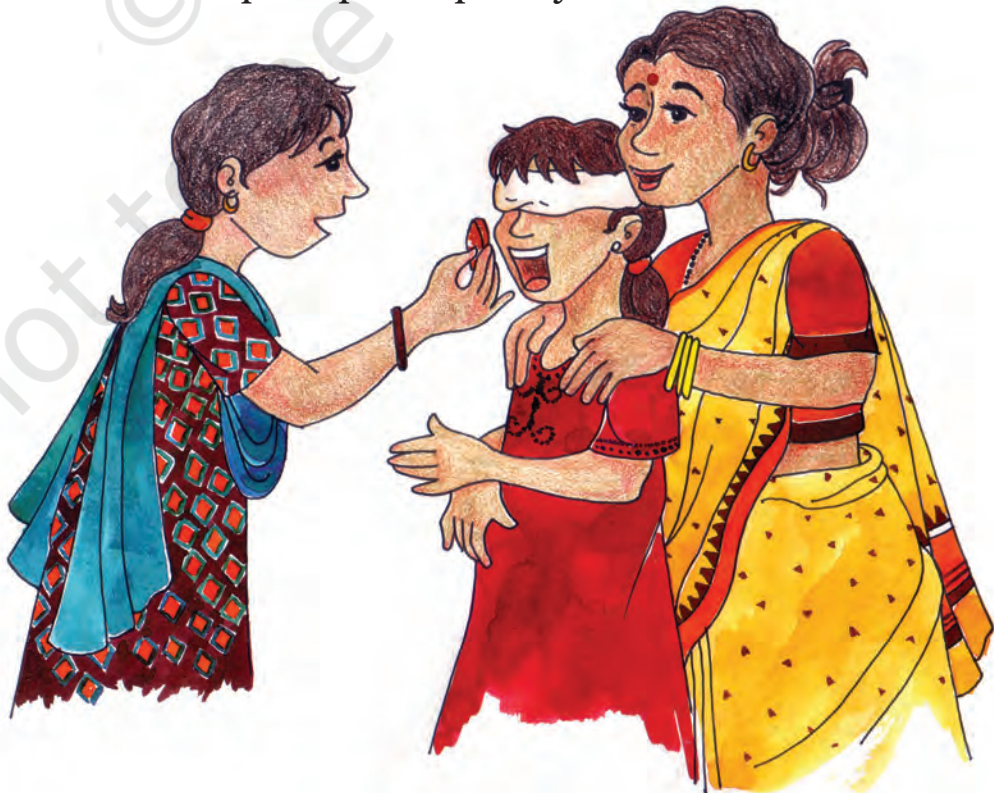
3. From Tasting to Digesting



Different tastes

Jhumpa ran into the kitchen and caught hold of her mother saying, “Ma, I am not going to eat this bitter *karela* (bittergourd). Give me *gur* (jaggery) and *roti*.” Ma smiled and said, “You ate *roti* and sugar in the morning.” Jhoolan teased Jhumpa, “Don’t you get bored of only one kind of taste?” Jhumpa replied quickly, “Do you get bored with licking *imli* (tamarind)? I bet your mouth is watering just by hearing the word *imli*.” “Sure I love the sour *imli*. But I eat sweet and salty things too. I even eat *karela*,” said Jhoolan and looked at her mother. They both laughed heartily.

Jhoolan said to Jhumpa, “Let’s play a game. You close your eyes and open your mouth. I will put something to eat in your mouth. You have to tell what it is.” Jhoolan took a few drops of lemon juice in a spoon and put them in Jhumpa’s mouth. “Sour lemon,” Jhumpa replied quickly.





Jhoolan then picked up a small piece of jaggery. Her mother suggested, “Crush it, otherwise she will know what it is?” Jhoolan crushed the jaggery but Jhumpa easily guessed it. They played the game with different food items. Jhumpa could tell the fried fish even before tasting it. Jhoolan said, “Now close your nose, and tell me what this is?” Jhumpa was confused, “It is a bit bitter, a little salty and somewhat sour. Give me one more spoonful.” Jhoolan took another spoonful of the cooked *karela*, uncovered Jhumpa’s eyes, and said, “Here it is, eat!” Jhumpa laughed, “Yes, give me more.”



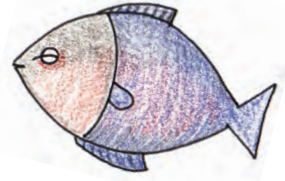
Discuss and write



- ◆ Jhoolan’s mouth started watering when she heard the word *imli*. When does your mouth water? List five things you like to eat and describe their taste.
- ◆ Do you like only one kind of taste or different ones? Why?
- ◆ Jhoolan put a few drops of lemon juice in Jhumpa’s mouth. Do you think we can make out the taste with just a few drops?
- ◆ If someone were to put a few seeds of *saunf* (aniseed) on your tongue, would you be able to tell with your eyes closed? How?



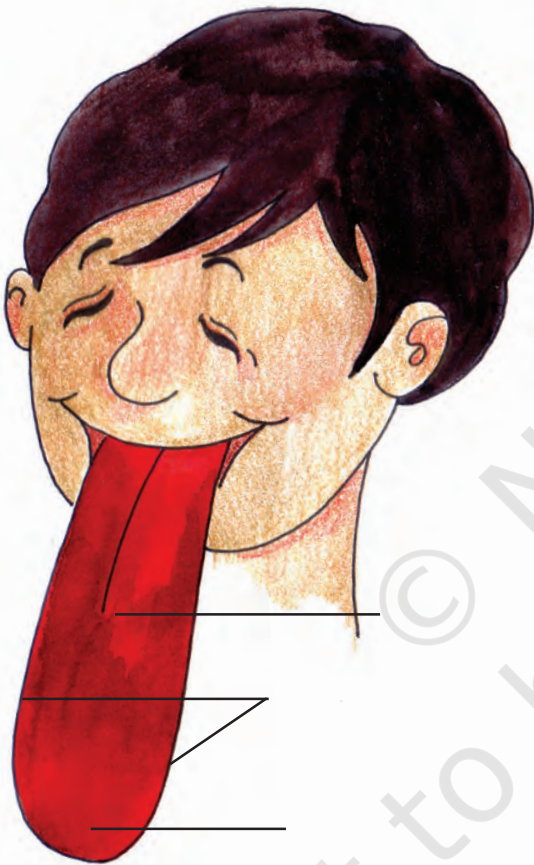
- ♦ How did Jhumpa make out the fried fish? Can you guess the names of certain things only by their smell, without seeing or tasting them? What are these things?
- ♦ Has anyone ever told you to hold your nose before taking a medicine? Why do you think they tell you to do this?



Close your eyes and tell

Collect a few food items having different kinds of taste. Play a game with your friends like Jhumpa and Jhoolan did. Tell your friend to taste the food and ask–

- ♦ How did it taste? What was the food item?
- ♦ On which part of the tongue could you get the most taste – in front, at the back, on the left or right side of the tongue?
- ♦ Which taste could be made out on which part of the tongue? Mark these parts on the picture given.
- ♦ One at a time put some things to eat in other parts of your mouth – under the tongue, on the lips, on the roof of the mouth. Did you get any taste there?



Label the parts of the tongue

Teacher's Note : Encourage children to be creative and to explore their vocabulary to describe different kinds of flavours. Discuss how the combination of different flavours brings so much variety in our food. Different combinations of taste (such as sweet-sour, hot-spicy) may be discussed in the class to develop this understanding.





Use a clean cloth to wipe the front part of your tongue so that it is dry. Put some sugar or jaggery there. Could you taste anything? Why did this happen?

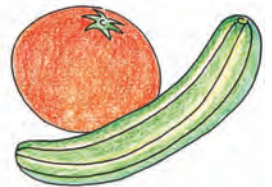
- ♦ Stand in front of a mirror and look closely at your tongue. How does the surface look? Can you see any tiny bumps on the surface?



Tell



- ♦ If someone asks you to describe the taste of *amla* or cucumber, you might find it difficult to explain.
- ♦ How would you describe the taste of these – tomato, onion, *saunf*, garlic.
- ♦ Think of words that you know or make up your own words to describe the taste.
- ♦ When Jhumpa tasted some of the things, she said “Sssee, sssee, sssee...”
- ♦ What do you think she may have eaten?
- ♦ Why don't you make sounds that describe some tastes?
- ♦ From your expressions and sounds ask your friends to guess what you might have eaten.



Chew it or chew it well: What's the difference?

Try this together in class:

- ♦ Each of you take a piece of bread or *roti* or some cooked rice.

Teacher's Note : Children will need help because it is sometimes difficult to identify exactly which part of the tongue can sense a particular taste.

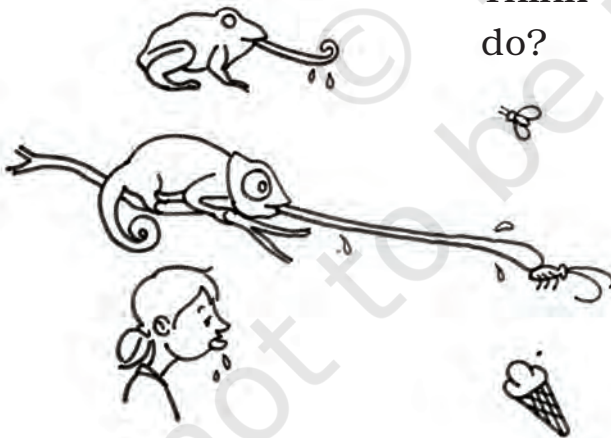


- ◆ Put it in your mouth, chew three to four times and swallow it.
- ◆ Did the taste change as you chewed it?
- ◆ Now take another piece or some rice and chew it thirty to thirty-two times.
- ◆ Was there any change in the taste after chewing so many times?



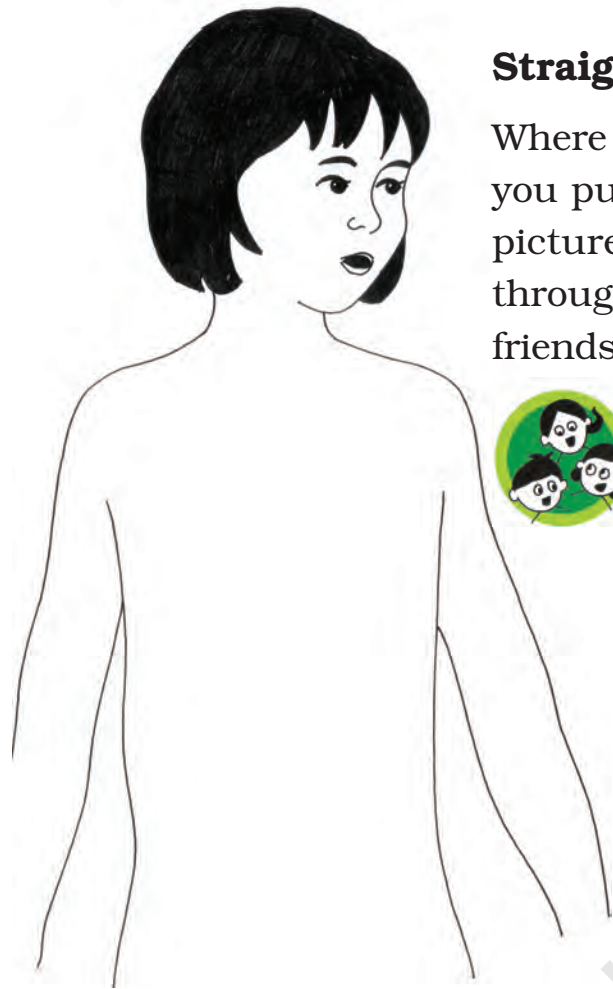
Discuss

- ◆ Has anyone at home told you to eat slowly and to chew well so that the food digests properly? Why do you think they say this?
- ◆ Imagine you are eating something hard like a green guava. What kinds of changes take place in it—from the time you bite a piece and put it in your mouth to when you swallow it?
- ◆ Think what does the saliva in our mouth do?



Teacher's Note : On page 27, children are not expected to draw the 'digestive system.' Encourage children to imagine and express their own ideas about what happens to the food in their body. Encourage sharing of pictures and free discussion, without any judgement of right or wrong.





Straight from the heart

Where do you think the food must be going after you put it in your mouth and swallow it? In the picture given here, draw the path of the food through your body. Share your picture with your friends. Do all of you have similar pictures?



Discuss

- ♦ How do you feel when you are very hungry? How would you describe it? For example, sometimes we jokingly say, “I am so hungry I could eat an elephant!”
- ♦ How do you come to know that you are hungry?
- ♦ Think what would happen if you do not eat anything for two days?
- ♦ Would you be able to manage without drinking water for two days? Where do you think the water that we drink goes?

When I am hungry my head aches.



I get angry easily when I am hungry.



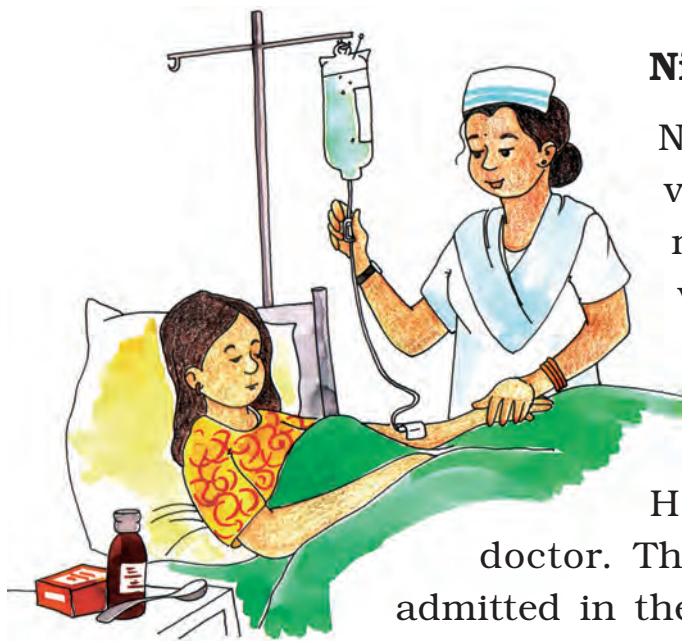
When my sister is hungry she cries.



I cry too, when I am hungry.

When I am hungry I feel tired.





Nitu was given a glucose drip

Nitu was very sick. All day she was vomiting and she also had loose motions. Whatever she ate, she vomited. Her father gave her sugar and salt solution. By evening Nitu was feeling weak and dizzy. When she got up to go to the doctor she fainted. Her father had to carry her to the doctor. The doctor said that Nitu should get admitted in the hospital. She needs to be given a glucose drip. Hearing this, Nitu got confused. She knew that during the games period in school, the teacher sometimes gave them glucose to drink. But what was a glucose drip? Doctor aunty explained, “Your stomach is upset. Your body is not keeping any food and water and it has become very weak. The glucose drip will give you some strength quickly, even without eating.”



Talk and discuss

Do you remember that in Class IV you made a solution of sugar and salt? Nitu's father also made this and gave her. Why do you think this is given to someone who has vomiting and loose motions?

- ◆ Have you heard the word 'glucose', or seen it written anywhere? Where?

Teacher's Note : Discuss with children about how glucose is used. It is too abstract for children to understand how glucose gives energy. You may like to invite a doctor to talk to the children. It is not expected that children will understand all the details at this stage.



- ◆ Have you ever tasted glucose? How does it taste? Tell your friends.
- ◆ Have you or anyone in your family been given a glucose drip? When and why? Tell the class about it.
- ◆ Nitu's teacher used to tell the girls to have glucose while playing hockey. Why do you think she did this?
- ◆ Look at Nitu's picture and describe what is happening. How is the glucose drip being given?

Martin's Window

Here's an old story
it seems so funny!
There was a window
in Martin's tummy!

Actually by mistake
Martin was shot.
Right in the stomach
it bled a lot!

The wound slowly healed
and was covered by skin.
But the hole was still there
you could peep right in!

Oh! what a chance
for doctors to study.
What happens to the food
inside the body!

The story seems odd
but it is really true.
The secret of Martin's stomach
helped us all - me and you!

– Rajesh Utsahi
Chakmak, August 1985
(Translated by Anupa Lal)



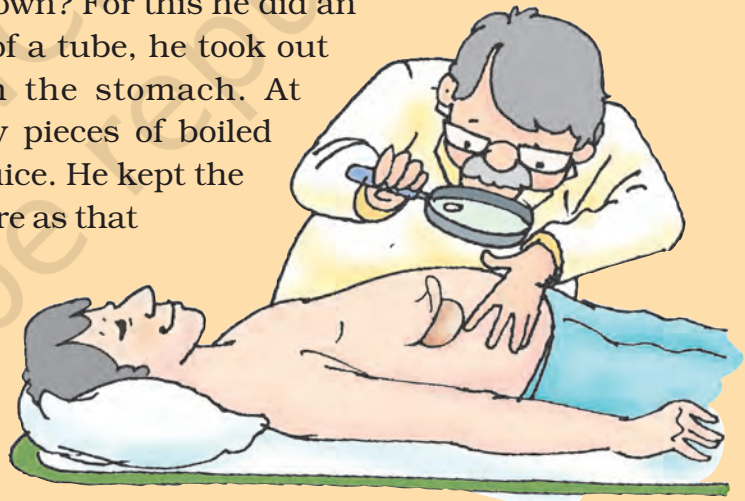
Story – A Stomach with a Window

In the poem, you read about a soldier called Martin. In 1822, he was eighteen years old and was very healthy. When he was shot, he got seriously hurt. At that time Dr. Beaumont was called to treat him. Dr. Beaumont cleaned the wound and put the dressing. After one and a half years, the doctor found that Martin's wound had healed except for one thing. He had a big hole in his stomach. The hole was covered with a loose flap of skin, like the washer in a football. Press the skin and you could peep into Martin's stomach! Not only that, the doctor could also take out food from the stomach by putting a tube in the hole. Dr. Beaumont felt he had found a treasure. Can you guess how much time he spent on doing different experiments on this stomach? Nine years! During this time Martin grew up and got married.

At that time scientists did not know how food was digested? How does the liquid (digestive juices) in the stomach help? Does it only help in making the food wet and soft? Or does it also help in digestion?

Dr. Beaumont took some liquid (juices) out of the stomach. He wanted to see what would happen to a food item kept in a glass filled with it. Would it get digested on its own? For this he did an experiment. With the help of a tube, he took out some digestive juice from the stomach. At 8.30am he put twenty tiny pieces of boiled fish in 10 millilitres of the juice. He kept the glass at the same temperature as that of our stomach – about 30°C. When he checked at 2pm he found that the pieces of fish had dissolved.

Dr. Beaumont tried this experiment with different food items. He gave Martin the same food at the same time and then compared how long it took for food to be digested in the glass and in Martin's stomach. He recorded his observations in a table.



Here is a part of his observation table:

No. Food item	Time taken for digestion	
	In the stomach	In the glass with digestive juices
1. Unboiled milk	2 hours 15 minutes	4 hours 45 minutes
2. Boiled milk	2 hours	4 hours 15 minutes
3. Full boiled egg	3 hours 30 minutes	8 hours
4. Half boiled egg	3 hours	6 hours 30 minutes
5. Raw egg, beaten	2 hours	4 hours 15 minutes
6. Raw egg	1 hour 30 minutes	4 hours

So, what does our stomach do?

Dr. Beaumont did many experiments and found out many secrets about digestion. He found that food digests faster in the stomach than outside. Did you notice this in the table?

Our stomach churns the food to digest it. The doctor also saw that the food did not digest properly when Martin was sad. He also found that the juice in our stomach is acidic. Have you heard of anyone talking about acidity – especially when that person has not eaten well or the food is not digested properly.

Dr. Beaumont's experiments became famous across the world. After this many scientists did many such experiments. What did you say? No, they did not shoot people in the stomach. Nor did they wait for a patient with a hole in the stomach. They used other scientific ways to look inside our bodies.

Did you like the story of Martin or, should we say, the story of our own stomach?

- Anita Rampal
Chakmak, August 1985



Think and discuss

Imagine if you had been in place of Dr. Beaumont, what experiments would you have done to find out the secrets of our stomach? Write about your experiments.

Teacher's Note : This story is to introduce children to the method of science and the passion with which scientists pursue their experiments. It is not necessary that children should understand the story about digestion in all its detail.



Good food, good health

Dr. Aparna has two patients – Rashmi and Kailash. Dr. Aparna talked to them to find out more about them. Read what the doctor found.



Rashmi, 5 years

She looks about 3 years old. She has very thin arms and legs and a pot belly (stomach like a balloon). She often falls sick.

She always feels tired and cannot go to school regularly. She does not have the strength even to play.

Food : She is lucky if she can get a little rice or one *roti* to eat in the whole day.



Kailash, 7 years

He looks older than his age. His body is fat and flabby. He has pain in his legs. He is not very active. He goes to school by bus and spends many hours watching TV.

Food : He does not like to eat home-cooked food like *dal*-rice, vegetables and *roti*. The only thing he finds tasty are chips, burger, pizzas and soft drinks from the market.

Dr. Aparna measured the height and weight of both the children. Then she told them, there is only one treatment for both your problems – proper food!





Discuss

- ◆ Why do you think Rashmi could eat only one *roti* in the whole day?
- ◆ Do you think Kailash would like games and sports?
- ◆ What do you understand by 'proper' food?
- ◆ Why do you think that the food of Rashmi and Kailash was not proper?

Find out



Talk with your grandparents or elderly people and find out what they ate and what work they did when they were of your age.

- Now think about yourself – your daily activities and daily diet.
- Are these similar or different from what your grandparents did and ate?



Proper food – every child's right?

You have read about two children. One is Kailash who does not like home-made food. The other one is Rashmi who does not even get one proper meal a day. About half the children in our country are like Rashmi. They do not get enough food that they need to grow and develop properly. These children are weak and sickly (often ill, in poor-health). But it is the right of every child to get proper food.





Think and discuss

- ◆ Do you know any child who does not get enough to eat in the whole day? What are the reasons?
- ◆ Why do you think people suffer from starvation?
- ◆ What kind of health problems occur when we do not get enough food for a very long time?
- ◆ Where do the grains from the field go after reaching the mandis?
- ◆ Have you come across any news related to huge spoilage in mandis or godowns? Collect some news of food spoilage or wastage on a large scale in mandis or godowns.
- ◆ Read the news and find out the reasons of spoilage of grains. How can such incidents be checked?

