

CLASS 5 EVS - NEW SYLLABUS (OUR WONDROUS WORLD)

CHAPTER 3: THE MYSTERY OF FOOD

HIGH-ORDER THINKING SKILLS (HOTS) & LOGICAL WORKSHEET

Q1. Amit's grandmother prepared fresh mango pickle and stored it in an airtight glass jar completely submerged in oil and salt. Amit wonders why the pickle remains fresh for months, whereas a fresh mango slice left on a plate spoils in just two days. What logical reasoning explains this difference?

Q2. Sneha put a piece of plain bread in her mouth and chewed it continuously for two full minutes without swallowing it. Initially, the bread tasted plain, but after a while, it started tasting sweet. What invisible process was happening inside her mouth that caused this change in taste?

Q3. A food packaging company states that their potato chips are packed with Nitrogen gas instead of regular air. If the chips were packed with regular atmospheric air instead, what logical impact would it have on the quality, taste, and shelf life of the chips?

Q4. Simran's mother is drying fresh mint leaves under the hot sun to store them for the winter. Simran thinks that boiling the leaves would be faster to kill germs. Why is sun-drying a more logical and effective preservation method than boiling when it comes to storing leafy items for a very long duration?

Q5. Imagine two children: Rohan eats mostly burger, pizza, and chips every day, while Kabir eats mostly plain white rice and boiled potatoes for all his meals. Even though both children are eating full meals, why can both of them be considered "malnourished"? What is missing in their dietary habits?

Q6. A student sets up an experiment with three identical glasses of milk:

- Glass X: Kept in a refrigerator at 4°C.
- Glass Y: Kept on a kitchen table at 30°C.
- Glass Z: Boiled and then kept on the kitchen table at 30°C.

Predict the order in which the milk in the three glasses will turn sour, starting from the fastest to the slowest, and justify your logic.

Q7. When a person suffers from a severe bout of vomiting and diarrhea, doctors strongly advise giving them an ORS (Oral Rehydration Solution) made of water,

sugar, and salt rather than serving them a full, heavy meal. What is the biological reason behind this advice?

Q8. Tina bought a packet of pasteurised milk from the dairy. The packet claims that the milk can be consumed directly without boiling it first. Explain the logical and scientific process behind 'pasteurisation' that makes this milk safe to drink straight from the packet.

Q9. In ancient times, before refrigerators were invented, sailors on long sea voyages often suffered from a disease called scurvy (bleeding gums) because they lived only on dried meat and biscuits. How does this historical mystery prove that our bodies need specific types of fresh foods to stay functional?

Q10. A restaurant left a bowl of cooked dal uncovered overnight. The next morning, the dal looked normal, but it had small bubbles on the surface and a sour smell. The chef warned the staff not to eat it. What caused the bubbles and the sour smell, and why is it dangerous to consume?

=====

ANSWER KEY & EVALUATION GUIDE (FOR TEACHERS)

=====

Ans 1: Oil and salt act as natural preservatives. The thick layer of oil cuts off the oxygen supply from the air, and high salt draws out moisture from any microbes. Without air and moisture, bacteria and fungi cannot grow, keeping the pickle safe, unlike the exposed mango slice.

Ans 2: When bread is chewed for a long time, the saliva in the mouth mixes thoroughly with it. Saliva contains digestive enzymes that break down the complex, tasteless carbohydrates (starch) present in the bread into simpler sugars (glucose), which makes it taste sweet.

Ans 3: Regular air contains oxygen and moisture. Oxygen reacts with the oils and fats inside the chips (oxidation), making them rancid (foul-smelling and bad-tasting). Regular air would also introduce moisture, making the chips soggy and shortening their shelf life. Nitrogen gas prevents this.

Ans 4: Sun-drying completely removes the moisture (water content) from the leaves. Without moisture, microbes cannot grow, allowing the dried leaves to be

stored for months. Boiling adds more water, which would cause the leaves to rot and decay within a few days if stored.

Ans 5: Both are malnourished because a healthy body needs a "balanced diet." Rohan eats junk food high in fats but low in essential vitamins and minerals.

Kabir eats only carbohydrates but misses out on proteins and vitamins. Both lacks the diverse nutrients needed for proper growth.

Ans 6: Order of souring: Glass Y -> Glass Z -> Glass X.

Glass Y is at a warm temperature ideal for rapid bacterial growth. Glass Z will take slightly longer because boiling initially killed existing bacteria, but new bacteria from the air will enter and multiply. Glass X will be the slowest because the low temperature of the fridge stops bacteria from active growth.

Ans 7: During vomiting and diarrhea, the body rapidly loses vital water and minerals, and the stomach becomes too weak to digest solid food. ORS does not require heavy digestion; it is immediately absorbed by the body to restore lost water and essential salts, preventing dangerous dehydration.

Ans 8: Pasteurisation involves heating the milk to a high temperature for a short time to kill harmful disease-causing microbes, and then cooling it down rapidly to prevent any surviving bacteria from multiplying. This process makes the packaged milk safe to drink directly.

Ans 9: It proves that the human body cannot survive healthily on just one or two food groups. Fresh fruits and vegetables contain essential micro-nutrients (like Vitamin C). A long-term lack of these specific nutrients causes deficiency diseases, proving the need for a varied diet.

Ans 10: The bubbles and sour smell are caused by the process of fermentation by harmful bacteria and wild yeast that entered from the air. These microbes consume the food nutrients and produce gases (bubbles) and acids (sour smell). Eating this spoiled food causes food poisoning due to toxic bacterial waste.