St. Andrews Scots School

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Session: 2026-2027 – Answer Key

Class: VIII Subject: Science Chapter: Exploring The Investigative World Of Science

Q.1. Answer the following questions:

a) Why does water boil at a lower temperature in hill stations than at sea level?

Water boils at a lower temperature in hill stations than at sea level due to the **decrease in atm ospheric pressure**. At sea level, the atmospheric pressure is higher, which means water mole cules need more energy (higher temperature) to escape into the gas phase. At higher altitudes, the atmospheric pressure is lower, so water molecules require less energy (lower temperature) to boil. This is because the vapor pressure of water must reach the standard atmospheric pre ssure of 14.7 pounds per square inch (psi) to initiate boiling. At higher altitudes, the surroundi ng atmospheric pressure is lower, meaning the water does not need to generate as much intern al vapor pressure to boil. Since water boils at roughly 203°F instead of 212°F at 5,000 feet, fo ods like pasta, eggs, or vegetables require longer cooking times.

b) (i) Which factors affect the way a puri puffs up when fried?

The way a puri puffs up when fried is influenced by several key factors:

- **Dough Thickness**: Thicker dough allows for more steam to escape, which can affect t he puffiness.
- **Flour Type**: The type of flour used can affect the elasticity and texture of the dough, i mpacting how well it puffs.
- **Moisture**: Adequate moisture in the dough helps in trapping steam, which is essential for puffing.
- **Oil Temperature**: The temperature of the oil affects how quickly steam forms and ho fast the puri puffs up.
- **Rolling Technique**: The method of rolling the dough can influence the puffiness, with an even thickness being ideal.
- **Placement in Oil**: The way the dough is placed in the oil can also affect the puffing p rocess.

(ii) How long did puri take to puff? (Time in seconds)

Puri takes about **20-25 seconds** to puff up in hot oil.

(iii) Did a thick puri still form a thin side while puffing?

Yes, a thick puri can still form a thin side while puffing. This occurs due to the uneven heat di stribution, where the side that first touches the hot oil usually cooks and puffs up first. The thi nner area allows steam to expand more easily, causing it to puff up more than the thicker part. Factors such as dough thickness, oil movement, and positioning also play a role in this pheno menon. To achieve a puri that is evenly puffed, it is essential to ensure that the dough is rolled evenly and that the oil temperature is just right.

(iv) Did pricking a hole in a puri prevent puffing?

Pricking a hole in a puri does not prevent puffing. In fact, it can be beneficial as it allows stea m to escape, preventing pressure buildup inside the puri. This results in a flat puri rather than a puffed one.

(v) Did puris made from fresh dough puff better than stored dough puris?

Yes, puris made from fresh dough puff better than those made from stored dough. Fresh dough retains its moisture and elasticity, which are essential for proper puffing. In contrast, stored dough can become dry and hard, leading to less effective puffing. The time taken for the dough to rest and the changes in its structure over time also play a significant role in the puffiness of puris.

c) If air particles are invisible, how can we prove that they constantly move and exert pressure?

This phenomenon occurs when tiny particles, like pollen grains, are suspended in a gas and viewed under a microscope. These particles exhibit a random zigzag pattern due to the invisible collisions of gas molecules with the suspended particles. This movement provides direct evidence that gas particles are constantly moving and colliding with each other and with other objects. Additionally, the process of diffusion can only occur if the gas particles are moving continuously, which is also explained by the kinetic theory of gases.

d) How did observing the phases of the moon help humans create the first calendars?

Observing the phases of the moon provided early humans with a natural and predictable method for tracking time. The Moon's changing phases, known as lunations, created a rhythm that could be easily observed and remembered, leading to the development of lunar calendars. These calendars were typically based on the 29.5-day lunar cycle and used to mark the passage of weeks and months. The Moon's phases also allowed for the prediction of eclipses and the synchronization of agricultural activities with the lunar cycle. This reliance on the Moon's phases as a timekeeping device was one of humanity's earliest scientific achievements, demonstrating our species' remarkable ability to observe, analyze, and systematize natural phenomena for practical benefit.

e) What would happen if earth lost its atmosphere for just one day?

If Earth lost its atmosphere, life would disappear within minutes to hours, and the planet would quickly become a cold, radiation exposed world similar to many lifeless bodies in our solar system.