

# Part A

## CCT Weekly Practice Science

### Unit 1 – Dental Plaque

“Dental plaque is defined clinically as a structured, resilient yellow-grayish substance that adheres tenaciously to the intraoral hard surfaces, including removable and fixed restorations. The tough extracellular matrix makes it impossible to remove plaque by rinsing or the use of sprays. Plaque can thus be differentiated from other deposits that may be found on the tooth surface such as materia alba and calculus. Materia alba refers to soft accumulations of bacteria, food matter, and tissue cells that lack the organized structure of dental plaque and are easily displaced with a water spray. Calculus is a hard deposit that forms by mineralization of dental plaque and is generally covered by a layer of unmineralized plaque.”

Source: Carranza's Clinical Periodontology, 11th Edition

#### Question 1.

Which of the following images resemble materia alba, dental plaque and calculus?

Image A

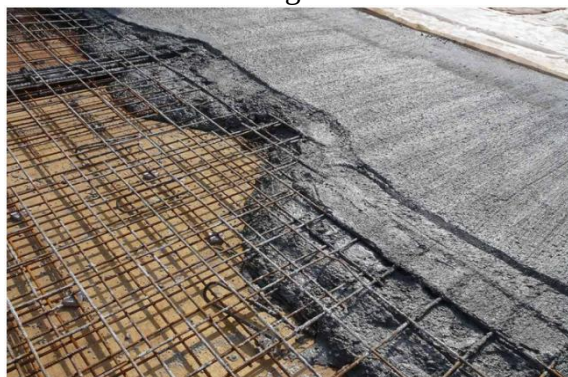


Source: Photo by [Dan Gold](#) on [Unsplash](#)

Image B



Image C



Source: <https://www.heatonproducts.co.uk/products/reinforcement-mesh/>

- A. Image A - plaque; Image B - materia alba; Image C - calculus
- B. Image A - materia alba; Image B - plaque; Image C - calculus
- C. Image A - calculus; Image B - materia alba; Image C - plaque
- D. Image A - materia alba; Image B - calculus; Image C - plaque

### Question 2.

“The tooth surface normally loses some tooth mineral from the action of the acid formed by plaque bacteria after ingestion of foods containing fermentable carbohydrates. This mineral is normally replenished by the saliva between meals. However, when fermentable foods are eaten frequently, the low pH in the plaque is sustained and a net loss of mineral from the tooth occurs. This low pH selects for aciduric organisms, such as *S mutans* and lactobacilli, which (especially *S mutans*) store polysaccharide and continue to secrete acid long after the food has been swallowed.”

Source: *Microbiology of Dental Decay and Periodontal Disease* by Walter J. Loesche, 4th Edition

From the above paragraph, it can be inferred that the main cause of tooth damage is...

- A. Production of saliva
- B. Formation of dental plaque
- C. Fermentation process in some foods
- D. Bacterial activity that forms acids

### Question 3.

To measure the status of a person’s oral hygiene, dentists measure the amount of dental plaque that is present on the person’s teeth. The following table is used to score the amount of plaque present on each tooth.

| Score | Criteria                                                                                                                                                                                |
|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0     | No plaque                                                                                                                                                                               |
| 1     | A thin layer of plaque sticking to the gum and the tooth margin adjacent to the gum. The deposit is only visible to the naked eye when the tooth surface is scraped with an instrument. |
| 2     | Moderate amount of plaque is visible on the surface of the tooth and at the margin of the gums. It can be seen with the naked eye.                                                      |
| 3     | An abundant amount of plaque is visible, covering the full tooth surface.                                                                                                               |

Source: *Essentials of Public Health Dentistry*, 5th Edition



Source: <https://tinyurl.com/tuw55t4h>

Using the above table what scores would you give the teeth labelled C, B, and A?

- A. 3, 2, 1
- B. 2, 1, 0
- C. 2, 2, 0 or 1
- D. 3, 2, 0 or 1

#### Question 4.

A person's plaque score is calculated by adding the individual tooth scores and dividing it by the total number of teeth that were examined. In the above example (Question 3), if only teeth A, B, and C were examined, what would be the person's plaque score?

- A. Excellent = 0
- B. Good = 0.1 - 0.9
- C. Fair = 1.0 - 1.9
- D. Poor = 2.0 - 3.0

#### Question 5.

Dental floss is the most widely recommended tool for removing plaque between teeth. Different types of floss are available depending on the material that they are made of. A number of clinical studies have demonstrated that there is no significant difference in the ability of these different types of floss to remove plaque.

Source: *Carranza's Clinical Periodontology, 11th Edition*

In the last statement, the results of the clinical studies are in support of which of the following?

- A. An observation
- B. A hypothesis
- C. A theory
- D. A fact

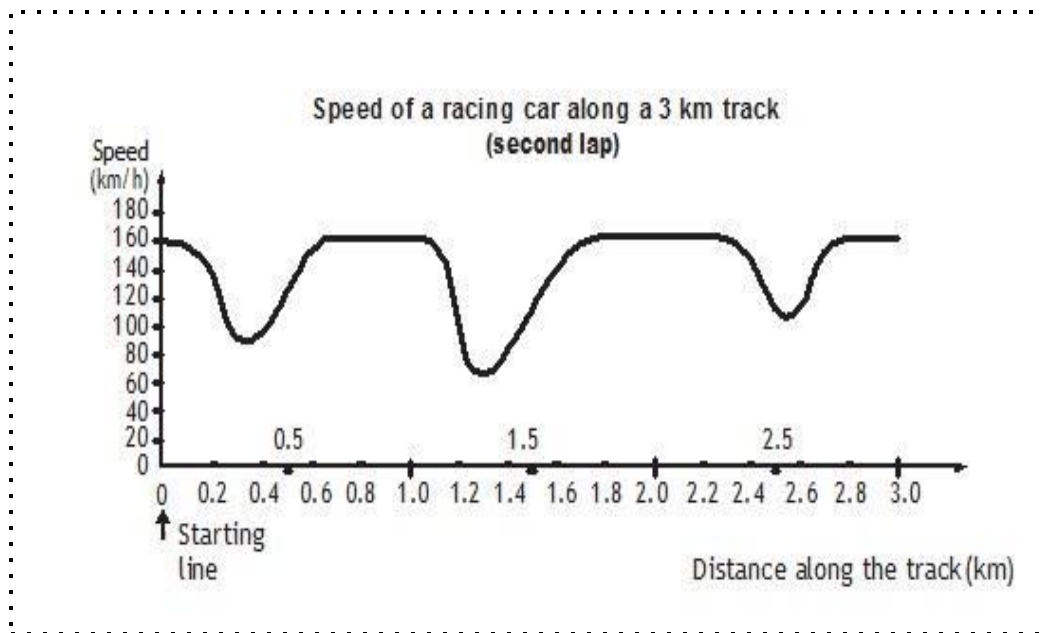
**Source of questions:**

**Centre for Teacher Accreditation (CENTA<sup>®</sup>) – [m.centa.org](http://m.centa.org)**

## **Part B**

### **SPEED OF RACING CAR**

This graph shows how the speed of a racing car varies along a flat 3 kilometer track during its second lap.



Note: In memory of Claude Janvier, who died in June 1998. Modified task after his ideas in Janvier, C. (1978): The interpretation of complex graphs – studies and teaching experiments. Accompanying brochure to the Dissertation. University of Nottingham, Shell Centre for Mathematical Education, Item C-2. The pictures of the tracks are taken from Fischer, R. & Malle, G. (1985): Mensch und Mathematik. Bibliographisches Institut: Mannheim-Wien-Zurich, 234-238.

**QUESTION 7:** What is the approximate distance from the starting line to the beginning of the longest straight section of the track?

- A. 0.5 km
- B. 1.5 km
- C. 2.3 km
- D. 2.6 km

**QUESTION 8:** Where was the lowest speed recorded during the second lap?

- A. at the starting line.
- B. at about 0.8 km.
- C. at about 1.3 km.
- D. halfway around the track.

**QUESTION 9:** What can you say about the speed of the car between the 2.6 km and 2.8 km marks?

- A. The speed of the car remains constant.

- B. The speed of the car is increasing.
- C. The speed of the car is decreasing.
- D. The speed of the car cannot be determined from the graph.

# Part A

## CCT Weekly Practice Science

### Answers

1. Options A

Plaque is a structured substance that has an outer covering similar to the covered scaffolds in Image A. Materia alba is unstructured and consists of a variety of cells similar to the debris in Image B. Calculus is hard calcified plaque which is similar to the reinforced concrete in Image C.

2. Option D

Bacteria in the plaque produce acids in the presence of fermentable food which damages the tooth.

3. Option: C

The score for tooth C cannot be 3 as the plaque does not cover the entire tooth surface. The score for tooth B cannot be 1 because the plaque is visible. The score for tooth A can either be 0 or 1 because no plaque is visible, but it may be present.

4. Option C

The plaque score is  $2+2+1$  or  $0$  divided by the number of teeth examined, i.e.  $3$ . So the plaque score is  $4/3$  or  $5/3 = 1.3$  or  $1.6 = \text{Fair}$ .

5. Option C

A theory is a principle set to explain phenomena already supported by data. Theories will pull together experimental results to provide full explanations.

**The solution for Part B is explained in Video Solution.**