Teeth And Bite Marks

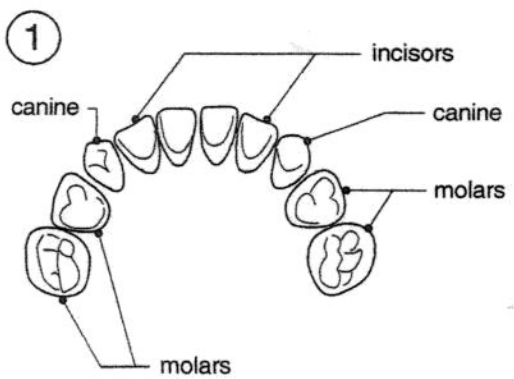
Topic

Forensic odontology

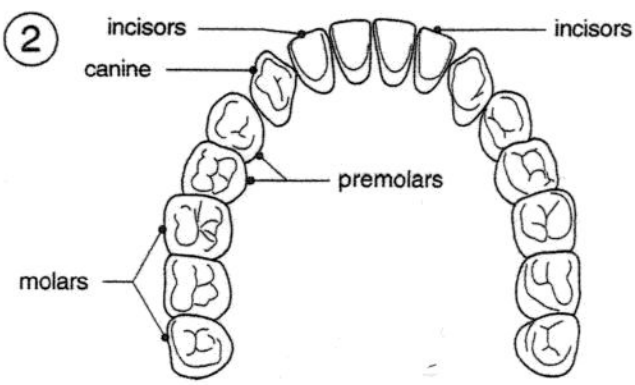
Introduction

Forensic scientists can use teeth for identification because the shape of everybody's teeth is different. Impressions made of teeth, therefore, look different, particularly if a person has missing teeth or fillings. Criminalists can use tooth impressions to identify the perpetrator of a crime by matching an impression of his teeth with the marks he leaves, e.g., in a piece of gum, cheese, an apple, or on a victim (even old bite marks can be used because they show up under ultraviolet light). Investigators can also use teeth to identify bodies by matching the teeth with dental records.

Children (see diagram 1 below) have 20 teeth, but they start to lose these when their adult teeth (see diagram 2 below) begin to grow. An adult should have 32 teeth (including the four wisdom teeth, which grow in the late teens/early 20s). Different teeth have different purposes – the front teeth that look like chisels are called incisors, the sharp, pointed teeth next to the incisors are called canines, while the premolars and molars have uneven flat surfaces. In this experiment, you will make a copy of the shape of your teeth and identify the teeth used for different purposes. Then you will take a bite out of a piece of cheese and hand it to your teacher, who will give you a piece bitten into by another class member. You will identify this student by looking at the copies of the tooth imprints made by your group.



Child's teeth



Adult's teeth

Time required

Part A: 45 minutes
Part B: 15 minutes

Materials

piece of hard cheese (e.g., Monterey Jack, cheddar) about 60 × 40 × 5 mm*
pen
polystyrene beverage cup (about 9 cm high)
sharp knife (e.g., craft or X-acto® knife)
stapler
sheet of white unlined paper (8½ × 11) for each member of the group
bulletin board large enough to display copies made by all the members of the group
one thumbtack for each member of the group

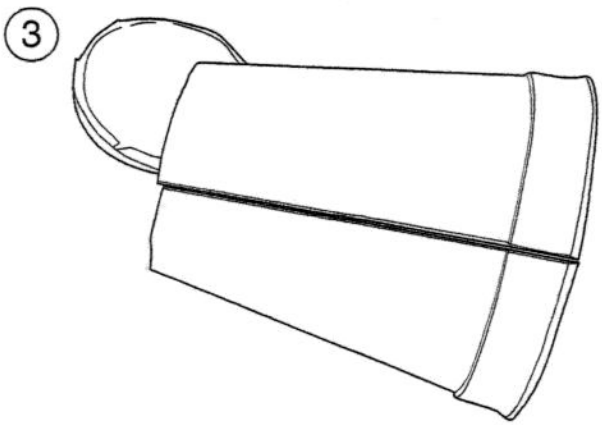
*Note to teachers: either carve the minimum size required from 8 oz blocks or divide 8 oz blocks into halves or thirds.

Safety note

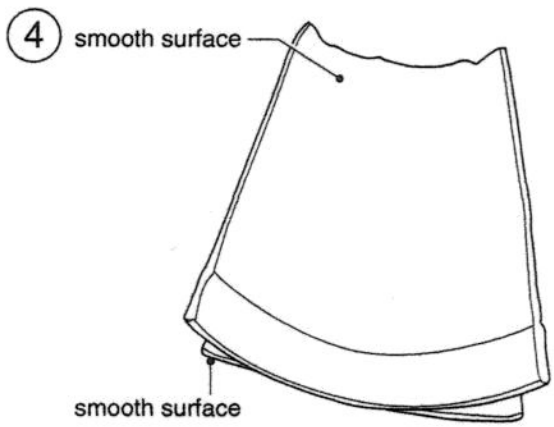
Make sure that the saliva has dried before working with the cups and the pieces of cheese. Do not eat any pieces of cheese.

Procedure

This experiment requires a group of 5 – 10 students.



Cup with slit and base cut off



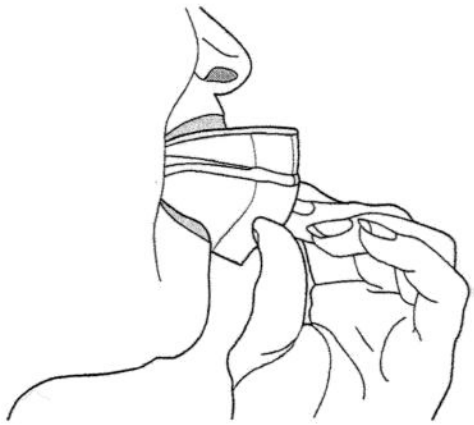
Folded cup cut into two pieces

Part A: Making a copy of the shape of your teeth

1. Cut off the base of the cup and then slit the cup as shown in diagram 3 above.
2. Fold the cup in two and cut along the folded edge to make two pieces (see diagram 4 above).
3. Place the two pieces of cup, with the smooth sides facing out, in your mouth between your teeth as in diagram 5 on the next page. Make sure the pieces go as far into your mouth as possible – you may need to trim a little of the plastic around the edges to allow them to fit comfortably.

4. Bite down hard on the pieces of plastic cup.
5. Remove the pieces of plastic cup from your mouth. Allow the saliva to dry and then label the top piece "upper" and the bottom piece "lower" as in diagram 6 below.
6. Staple the pieces labeled upper and lower onto the sheet of paper. Write your name on the sheet of paper and pin it to the bulletin board.

5

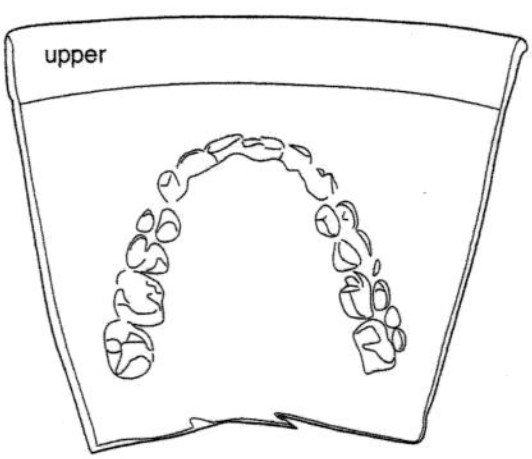


Putting the pieces of cup into your mouth

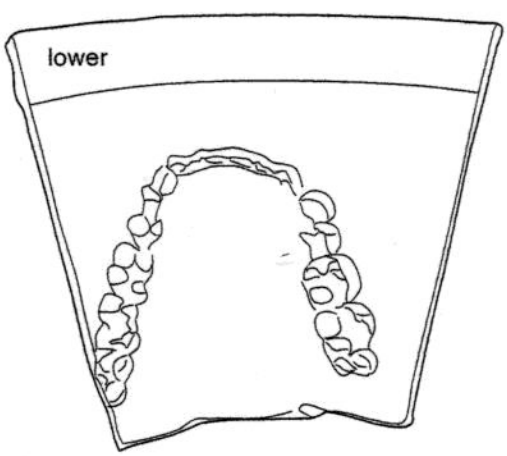
Part B: Identifying who made the bite

1. Take a bite from the piece of cheese. Use the pen to mark the edge (opposite the bite) with your initials. Hand the cheese to your teacher.
2. Take a piece of cheese from the teacher. Do not look at the initials marked on the edge.
3. Study the marks made by the teeth in the cheese. Then look at the teeth marks recorded by you and your fellow students. Select the one that shows the maker of the bite mark in the cheese.
4. Look at the initials on the edge of the cheese and check with the name on the sheet you have selected.

6A



6B



Bite marks on the upper (A) and lower (B) piece of cup

DATA TABLE	
Upper	Lower

Analysis

Part A: Making a copy of the shape of your teeth

1. Using the charts of child and adult teeth shown in diagrams 1 and 2 on page 3.06–1, identify and label the impression of your teeth in the data table. Identify the different teeth (molars, premolars, canines, incisors), observe the differences between the top and bottom sets, and highlight any gaps where teeth are missing or out of alignment.

Part B: Identifying who made the bite

1. Did you identify the person who made the bite?

Want to know more?

See Section 10: Our Findings