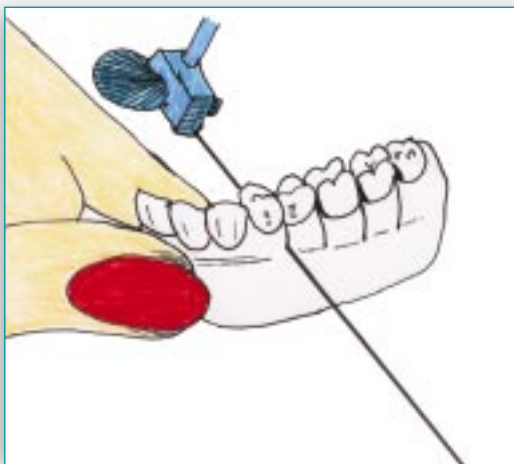


UNIT 6

Prosthetics



A “Where does good digestion begin from?”

Task 1

1. What's wrong with Peter's granddad?
2. Why is he grumbling?
Read on to find out.

Picture of Granddad



Figure 6.1

This is what's wrong with Peter's granddad: he is trying to eat something, but he cannot get used to his new denture and he is in a bad mood. He is looking at an article in a magazine called “Dental Laboratory” and is asking Peter to read it for him. Peter reads the article aloud:

In order for our body to serve us and continue to live, it requires fuel. The fuel is of two kinds: a) oxygen and b) food. We take oxygen from the air when we breathe in. We find food in our environment. Food cannot be used by our body in the form we find it. It needs to be processed. Much of our food contains water. Extra effort is needed on the part of our heart to process too much food and this may result in high blood pressure and heart problems.

Where does our food processing take place? Where does it start from? It starts from the mouth. This is where the most important stage of digestion (that is how food processing is called) takes place, and that's why dentists and dental laboratory craftsmen must pay attention to our teeth restorations. Proper chewing, crushing, grinding and mixing with saliva equals to good digestion which in turn equals to good health. A good set of teeth is the number one tool for mastication.

Unfortunately, the older we get, the less strong our teeth become. Certainly, a good denture of false teeth is a good substitute for our own teeth, but we could not argue that mastication is as perfect as it used to be. Therefore, take care of your teeth, so that they last long. Find a good dentist who co-operates with skillful dental laboratory technicians and let them take good care of your teeth, which can last long!

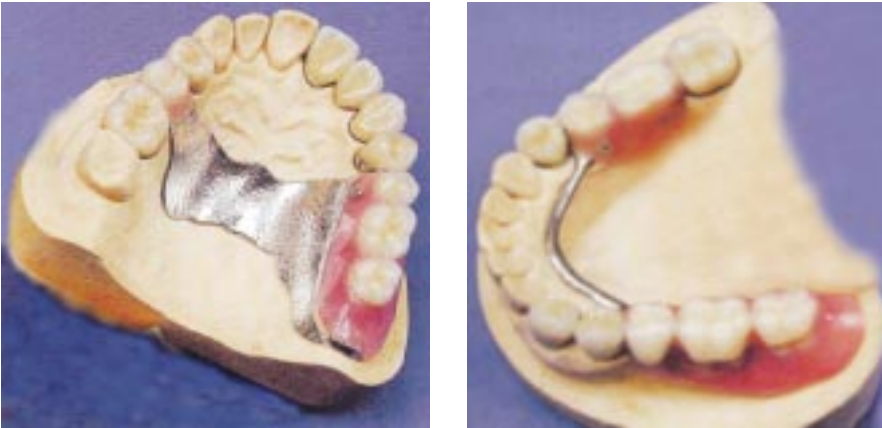
- GRANDDAD: Well, Peter? What do you say?
- PETER: Don't believe in everything they say about false teeth grandpa. You'll soon get used to your new teeth and you'll eat everything you like.
- GRANDDAD: Is that so?
- PETER: Of course. Besides, I'm going to make a poster for you in bold colourful letters, which I'll hang on the wall with all necessary instructions on how to take good care of your new teeth. Now, I'm going to make a revision for an exam that's going to take place on Monday on Prosthetics. I'm going to prepare some notes on some of the questions, and when I'm through with it, we are going to play a round of backgammon together. Promise?
- GRANDDAD: Promise, I'll enjoy it.

B Preparing for an exam on Prosthetics

Peter is going to prepare the following questions for his exam on Prosthetics. He has his own way of organizing his study. He prepares record cards. On the front side, he writes the question or the title of a topic. On the other side, he sometimes makes a diagram or a graph, or he writes as many notes and information on the question as he can gather. Have a look at the exam questions first.

- Question 1. Give a definition of Prosthetics.
- Question 2. What disorders could arise because of loss of teeth? Are they serious, if any?
- Question 3. What are the materials used to make dentures?
- Question 4. Mention at least 3 kinds of materials used for impressions. What are their advantages. Any disadvantages?
- Question 5. Some stages in the construction of a full denture are the duty of a dentist. Some others, however, are the responsibility of a dental laboratory. List them in order.
- Question 6. Apart from dentures what other restorations are offered by Prosthetics? Mention at least two of them and give a description in a paragraph form.

Practical part of the exam: You must know how to mix a material e.g. alginate in a tray, do the mixing, and then present it to an examiner.

Peter's record card No 1**Side 1: Picture. A Miracle of prosthetics****Figure 6.2****Side 2: Definition of Prosthetics**

Prosthetics is an art, developed by humans to restore and ease problems dealing with loss of teeth like

- a) The normal appearance of teeth
- b) The masticatory function
- c) The speech function.

Loss of teeth affects all the above points. When there are no teeth left in a jaw, a complete full denture is needed. When there are some teeth left, the artificial replacement is called partial denture.

Task 1

Consult Peter's card No1 and complete the blanks.

a) What is affected by loss of teeth?

1	
	3
2	

b) Artificial replacements

loss of all teeth

loss of several teeth

Peter's record card No 2

Side 1: Picture diagram

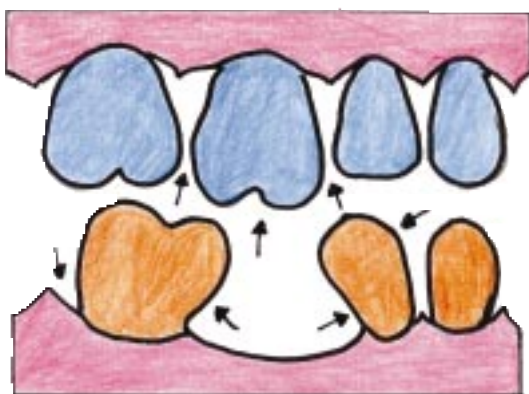


Figure 6.3

Side 2:**a) Effects of loss of one tooth**

- Opposing tooth has nothing to bite on
- It over-erupts
- It is not cleared by mastication
- Gap left becomes food trap
- Gingivitis and caries are produced

b) Effects of loss of more teeth

- Opposing teeth have nothing to bite on
- Mastication is not efficient
- People avoid foods that require a lot of chewing
- Malnutrition
- Excessive stress on teeth left leads to periodontal disease

Task 3

If you were to provide a full answer to a question you would have to do it in a paragraph form. Study the information in note form on side 2 of Peter's record card, and write two paragraphs of at least 60 words on a) and b) on the effects of loss of one tooth and the effects of loss of more teeth. The words, phrases in the box may help you.

to start with, let's begin with, first of all, as a result, consequently, also, on the one hand, on the other hand, however, after that, so long as, as soon as, furthermore, in addition, moreover, this could lead to, thus, finally, in the end, eventually

a)

No of words:

b)

No of words:

Peter's record card No 3**Side 1:****Figure 6.4** Picture of a Full denture**Figure 6.5** Picture of a Partial Denture**Side 2:**

Two main materials are used for the construction of dentures: a) acrylic, pink for the base of a denture, and similar to the colour of our teeth acrylic for teeth, b) metal (stainless steel and chrome-cobalt) for the framework of partial dentures, and if there is a heavy bite for the palate of a full denture.

Important point: Acrylic consists of two materials a) polymer (in powder form), b) monomer (in liquid form). We have to mix them together to form a plastic mass which behaves like dough. By applying a process which is called curing, this dough sets into hard acrylic.

There are two methods of transforming the plastic mass into hard acrylic: a) heat-curing, b) cold-curing. Heat-curing is the process during which the dough is put in a special flask in an oven where it is heated slowly. Cold-curing is the process during which a catalyst is added which allows the dough to cure at room temperature. Heat-curing acrylic is preferred for dentures and orthodontic appliances. Cold-cured (self-cured or autopolymerized acrylic) is preferred for temporary crowns, denture repairs, and impression trays (More on cold-curing or self-curing acrylic resin in card 3+).

Peter's record card No 3+

Here are two pictures of how self-cure resin is used a) for repairs b) for models in a flow technique procedure (Figures 6.6, 6.7).

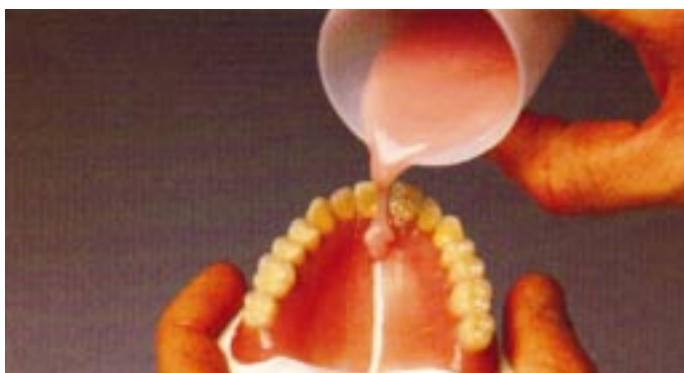


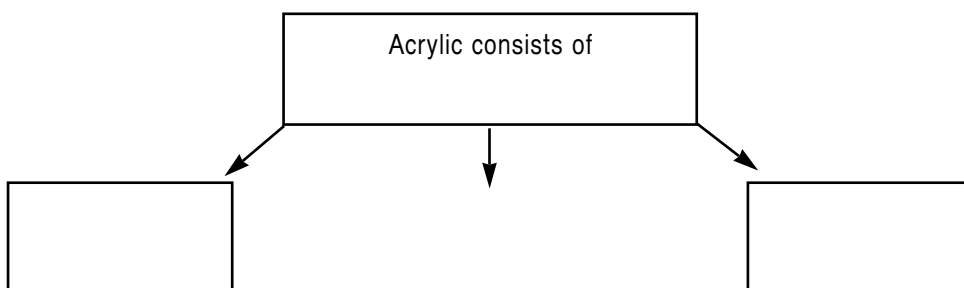
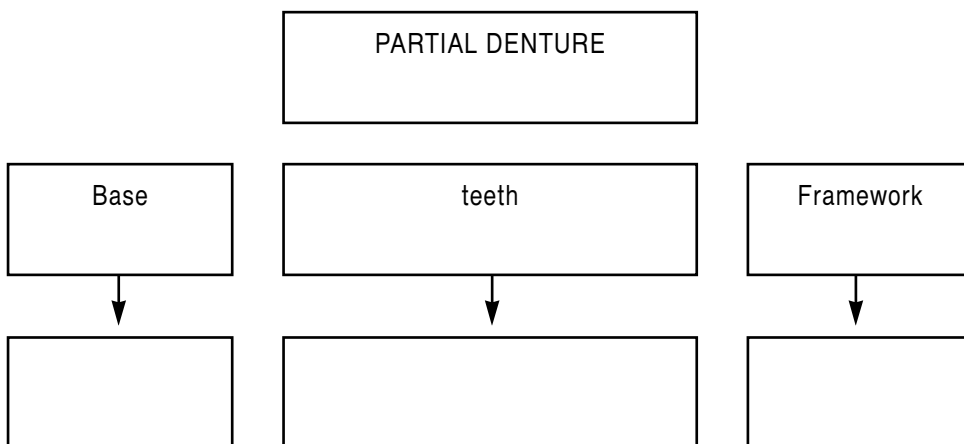
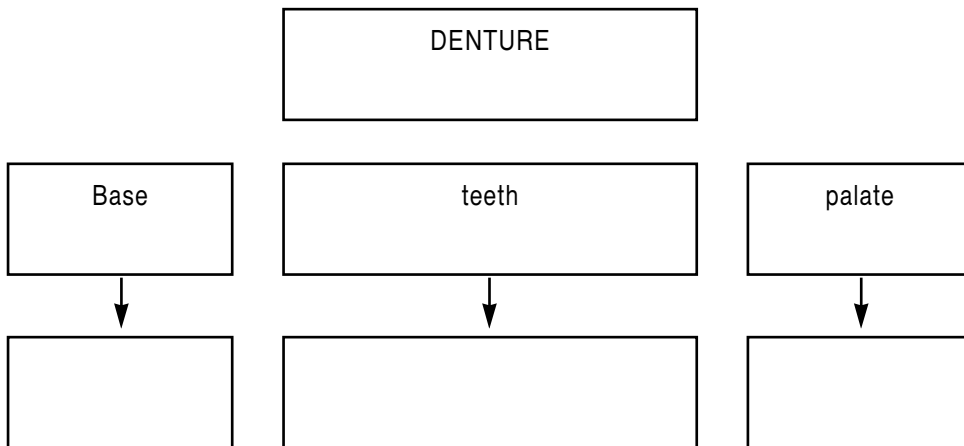
Figure 6.6

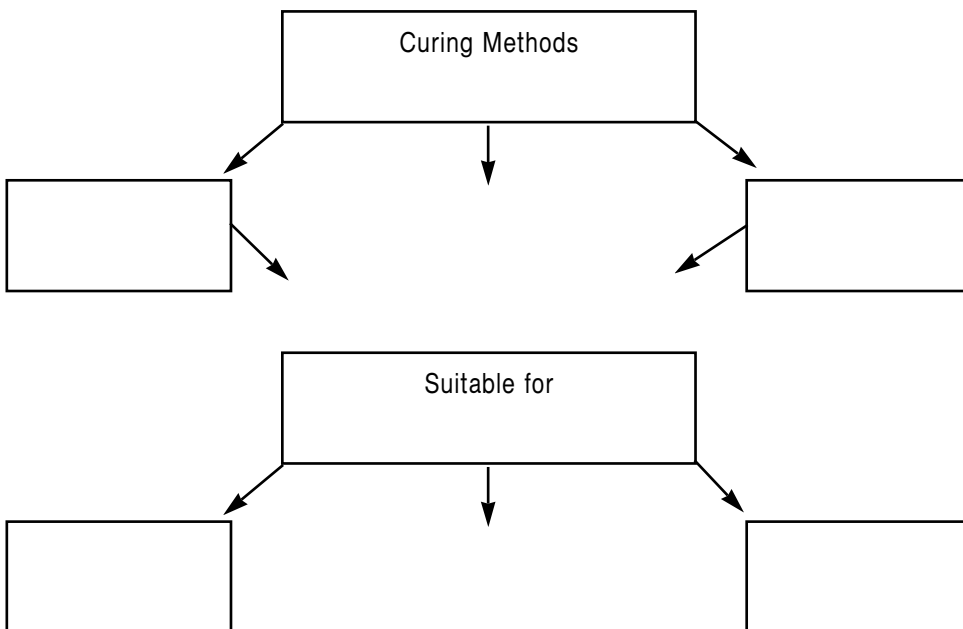


Figure 6.7

Task 4

Fill the boxes after consulting Peter's record card No 3.





Peter's record card No 4

Side 1: Impression Materials

Names

A. ALGINATE

B. IMPRESSION PASTE

Uses

Used when there are no teeth left in the mouth and for partial impressions.

Used in cases when there are no teeth left, for special tray impressions, for lining baseplates, and for relining dentures.

C. ELASTOMERS

Used when impressions for special trays are needed, for impressions where undercuts are present, and in cases of flabby ridges.

D. COMPOSITION

Used when impressions for special trays are needed and for peripheral seal, for special tray impressions, for a toothless mouth.

Side 2:**Advantages****Disadvantages**

A. Alginate is accurate.

but

Dimensional changes appear.

B. Impression paste is accurate, can be tried in mouth while additions can be made.

but

It is not the right material for partial impressions because it sticks to the lips and skin.

C. Elastomers are accurate and stronger than alginate.

but

They need longer setting time and they are more expensive than alginate.

D. Composition is simple in use and rapid. Does not need mixing. The best possible retention can be achieved.

but

It is not the right material for final partial impressions, while it is time consuming.

Task 5

Peter had the exam. Although he had studied hard, he gave many wrong answers. He confused uses, advantages, disadvantages and materials.

- a) Can you give him a mark? Each correct answer gets 2 points. For “excellent” he must get 12. Six points is a “pass” mark only.
- b) Provide the correct answer in cases what he says is wrong.

			Mark
a) 1. Alginate.	Advantages:	It is accurate.	<input type="text"/>
	Disadvantages:	It is not the right material for partial impressions.	<input type="text"/>
2. Elastomers.	Advantages:	They are not as accurate as alginate.	<input type="text"/>
	Disadvantages:	They are expensive and need longer setting time.	<input type="text"/>
3. Composition.	Advantages:	It can be tried in mouth. Additions can be made.	<input type="text"/>
	Disadvantages:	It shows dimensional changes.	<input type="text"/>

b) Correct answers

Peter's card No 5**Side 1: Duties of a dentist (Surgery procedure)**

Stage 1. The dentist takes the first impression of the patient's mouth. The technician makes a special tray.

Stage 2. If the model is OK, then the dentist proceeds to making the final impression. If not, then another model impression is made.

Important point: the dentist, using the prosthetic instruments, trims the impression so that, on the one hand the wax rims represent the correct position of the teeth, and on the other, they give proper support for the lips. Also, the wax rims must show the correct distance of the jaws when they are apart, and the correct jaw relationship when the jaws are fixed together. The dentist must also make marks for the midline of the face and rest position of the upper lip. A prescription is written by the dentist for the laboratory.

Stage 3. The dentist checks the occlusion of the trial dentures on the articulator, and then fits them in the patient's mouth. The patient tells the dentist if he/she is feeling comfortable, if his or her dentures are OK in terms of stability and occlusion. In addition, the patient must decide if the shade of colour, the size, and shape of teeth pleases him or her. No adjustments can be made once the dentures are finished.

Finally, the dentist marks the junction of the hard and soft palate and the extent of the pad of softer tissue in this area. A new prescription is written for the dental technician and his/her assistant who prepares the acrylic denture.

Stage 4. Once the acrylic dentures are returned to the dentist then they are fitted in the patient's mouth, so that their retention and stability are checked. The parts of the dentures that create problems are removed (with burs or stones Figure 6.8) and then the patient is shown how to insert and remove his or her denture.

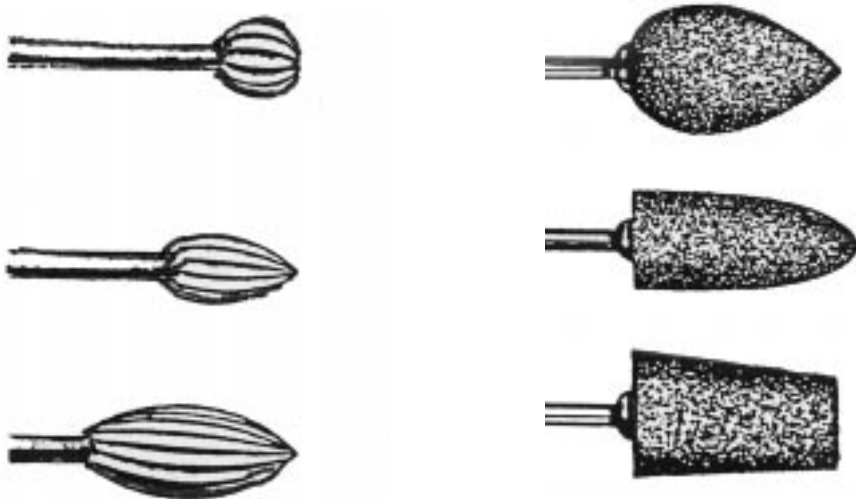


Figure 6.8

Side 2: Duties of a dental technician and his assistant.

Stage 1. The technician pours plaster into the impressions taken by the dentist. In this way an exact reproduction of the patient's jaws is made.

Stage 2. The technician prepares wax rims on wax or acrylic base plates which represent the alveolar bone and teeth and will help the dentist mark the patients bite (or relationship of jaws).

Stage 3. The technician mounts the models on an articulator which shows an exact three-dimensional copy of the patient's jaws. Then he or she prepares a perfect copy of the final denture with the actual teeth on, which, after having been waxed, trimmed, and polished they are tried on the patient (Figures 6.9, 6.10 show pieces of coloured wax and wax trimming instruments).

Stage 4. This is the final stage. During this stage the trial dentures are invested in a plaster mould. The wax is eliminated with boiling water, and its space is filled with acrylic dough and heat-cured in a warm oven. The dentures are ready for fitting once they are trimmed and polished. They are put in a bowl of water and stay there until it is time for the patient to try them on.



Figure 6.9



Figure 6.10

Peter's record card No 6

Other teeth restorations

Side 1:

1. **Partial Dentures.** They can be of two types: acrylic, and acrylic plus a metal skeleton (figure 6.11). The stages for their construction are the same ones as those for making dentures.
 - a) Acrylic partial dentures can be improved with the addition of clasps made of stainless steel wire or chrome-cobalt. These clasps prevent vertical displacement of the denture.
 - b) Skeleton dentures are much better dentures because the metal skeleton is stronger than acrylic, but they take longer to make and are more expensive than the acrylic dentures.



Figure 6.11

2. Immediate Dentures

These are prepared before the front teeth of a patient, who is going to have a denture made, are extracted. The dentist gives the technician the final impressions. The technician cuts off the model of the teeth that will be extracted, and fits in artificial teeth. Then he waxes-up the denture and processes it in acrylic. The immediate dentures are fitted in immediately after the teeth are extracted by the dentist, and replaced later (within a year) by dentures.

3. Overdentures

In cases there are roots left and standing teeth, it is preferable to prepare an overdenture on top of them, so that the alveolar bone and ridges do not shrink. However, before the overdenture is fitted the retained teeth and roots have to be treated first (e.g. reduce an existing crown to a small stump).

Side 2:**1. Obturators**

Sometimes there are cavities in the mouth which have resulted from various reasons:

a) An accident took place and part of a patient's jaw has been removed, b) A patient has got a cleft palate, c) A cyst has created a cavity.

Then, a plug has to be inserted to fill the empty space. An obturator is an appliance in the form of a plug which is plugged into the cavity. It is made by using an elastic impression material. Alternatively, the obturator is made of black gutta-percha which is remade in acrylic after it has moulded itself to the shape of the cavity. Obturators can be attached to dentures.

2. Soft linings

Dentures can lose their fit and become loose after years of use. Immediate dentures can lose their fit too. Because our mouth is in continual movement, a material which is slow to set is needed. Such material is black gutta-percha which nowadays has been replaced by a slow curing acrylic resin called soft lining. Alternatively, the soft linings are used as tissue conditioners and allow tissues to heal.

3. Implants

When there are no roots left, then artificial roots are implanted into the alveolar bone. Drills have to be made into the bone. In these holes threaded cylinders are screwed (Figure 6.12). The metal used to make implants is titanium. Implants require a team of specialists to be made, are expensive, and not suitable for all patients.

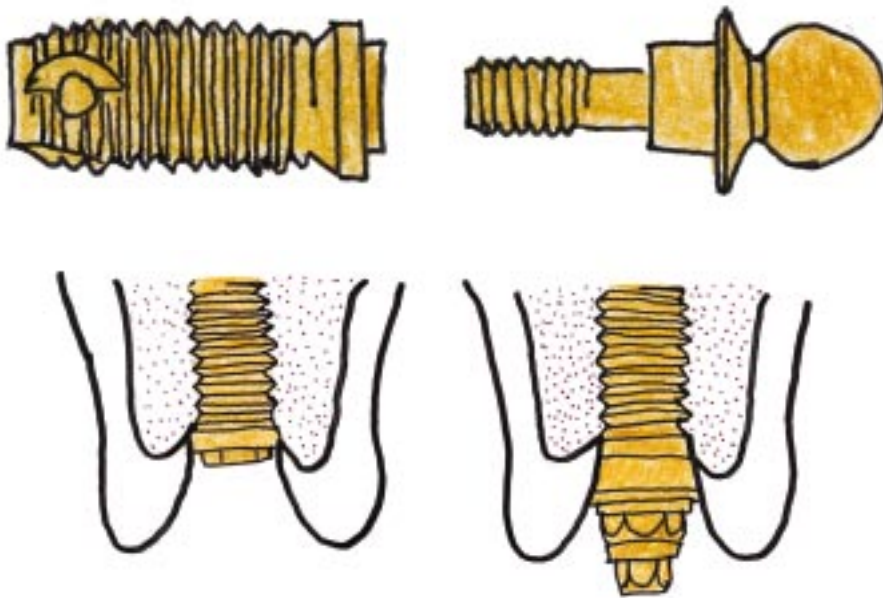


Figure 6.12

Peter's card No 7

Practical part of the exam: Preparing a mixture of alginate

First, a tin of alginate powder is needed, a flexible plastic bowl, a spatula, and water at room temperature. Second, the tin is shaken before opening in order to loosen the powder. Be careful. Do not inhale any powder after opening the tin. Then, measure the powder, the water, and mix them in the bowl vigorously and consistently in a smooth way. The mixture sets in a few minutes. It must be wrapped in a wet towel until the model is made, otherwise, the impression will undergo dimensional changes (lose water or absorb water) and the model will be inaccurate. If the model cannot be made immediately, put it in a plastic bag and seal it. Finally, do not forget that an ordinary tray is not very suitable for alginate impressions. A perforated tray (Figures 6.13 and 6.14) is preferable.

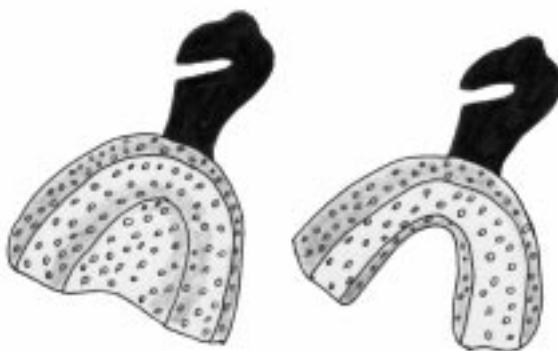


Figure 6.13 Perforated trays (upper and lower). There are still teeth in the mouth.



Figure 6.14 Perforated trays (upper and lower) when there no teeth left.

Time for fun

Task 6

Here is another crossword puzzle with many correct answers. Follow the instructions in Units 2 and 4.

											P											
											A											
											R											
											T											
											I											
											A											
											L											
											D											
											E											
											N											
											T											
											U											
											R											
											E											
											S											

Task 7

Here are some words taken from the passage: vigorously, consistently, immediately. They tell us how to mix the water and when the model will be made. Words that tell us how to do things, when, or give us information about the place and time that the action happens are called adverbs.

Sometimes they are formed from words that are called adjectives and describe things by adding the ending -ly: Vigorous, consistent, immediate are adjectives. Vigorously, consistently, immediately are adverbs.

Form adverbs from the following adjectives:

smooth
 inaccurate.....
 final.....
 clear
 careful
 alternative
 partial.....
 artificial

C Denture care: a poster

PETER: Hi grandpa! I love you!
 GRANDPA: Hi Peter. I love you too.
 PETER: Did you enjoy your meal?
 GRANDPA: Yes, I did.
 PETER: Good! Do you always wish to enjoy your meal?
 GRANDPA: Of course, I do!
 PETER: Good! Do you wish to keep your mouth healthy?
 GRANDPA: Sure!
 PETER: Good! You don't wish to get denture stomatitis, do you?
 GRANDPA: Definitely not.
 PETER: Good! If you wish to feel good, Denture Care is the Answer.
 (Peter sticks the poster over Grandpa's desk).

RULE 1

(after every meal)

- Take off your dentures. Get some soap and fill the wash basin with cold water. Scrub your denture with a scrubbing brush.
- **Warning:** Hot water may damage the material your dentures are made of.

RULE 2

- Keep your dentures in water when they are not worn.
- **Warning:** If dentures dry out, the material they are made of may warp and then they won't fit any more.

RULE 3

- Do not forget to take off your dentures when you sleep.
- **Warning:** You may get choked.

RULE 4

- Do not miss to check up your dentures once a year.
- **Warning:** Your mouth tissues may get inflamed.

RULE 5

- Clean old stained dentures with special denture cleansers.
- **Warning:** Your mouth may not remain healthy otherwise.

**Your grandson,
Peter**

Task 1

People need to have a private corner where certain rules apply. In public places (e.g. means of transport, banks, schools etc.) certain rules are in action. People do not behave the way they behave when they are at home or on their own.

Write 7 rules that apply in your home or anywhere you like. You must use, however, the formula do not in order to express prohibition and the plain form of a verb to show that people should behave in a certain way, e.g.

- a) Do not smoke in the bedrooms!
- b) Clean your shoes before you enter!

RULES

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

Task 2

It is well known that old people are stubborn and forgetful. It is now a year that Peter's grandpa has his dentures fitted in. Do you think he has obeyed all the rules consistently so far? Look at picture (6.15a) which shows part of his dentures. What has happened to it?



Figure 6.15a

Fill the gaps in the sentences below with phrases from the box. The first one has been done for you.

Has ... used, has damaged, has got, have accumulated, has dried, have appeared, has missed, has forgotten, has ... obeyed, has filled.

1. Peter's grandpa has forgotten to scrub his dentures after meals.
2. Grandpa's denture..... plaque all over it because grandpa to visit his dentist at least once every six months.
3. Toxic substances on his denture because he not a special cleanser to clean it.
4. Stains on the metal part of his denture because he not the rules all the time.
5. The material of his denture out because he kept forgetting to put them in water at night.
6. Peter's grandpa the material of his denture because hethe wash basin with hot water quite often.

The verbal structures in the box above, describe events that took place very recently. Also the results of these events are quite obvious.

Here is the formula:

(I, you, we, they) have
(he, she, it) has

+ a verbal part (past participle)
(e.g. used, forgotten, dried, etc.)

This formula is called **Present Perfect Tense**. For regular verbs the past participle has the ending -d (if the verb ends in -e, e.g. agree → agreed) or -ed (if the verb ends in any other letter of the alphabet). Verbs that end in -y and there is a vowel in front of it (a, i, o, u, e are vowels) then, they follow the rule. If there is a consonant (all the other letters of the alphabet apart from a, i, o, u, e are consonants) in front of -y then, they get an -ied ending (e.g. obey → obeyed, but dry → dried). Verbs that do not follow the above rules are irregular and they have their own special past participle (e.g. get → got, forget → forgotten).

Task 3

Talk about 5 things you or your friend have/has done today and about 5 things you or your friend have/has forgotten to do today, e.g.

I have played tennis.

Athena has not done her homework.

- 1.
- 2.
- 3.
- 4.
- 5.

- 1.
- 2.
- 3.
- 4.
- 5.

Please, pay attention to the following way of talking about things, events, situations, states of mind.

If Peter's grandpa had obeyed the rules, all problems with his denture would not have happened.

If grandpa **had obeyed** the rules:

- plaque **would not have got** all over his denture
- toxic substances **would not have accumulated** on his denture
- the material of his denture **would not have dried out**
- stains **would not have appeared** on the metal part of his denture

The formula:

if + had + past participle

followed by the formula:

would + have + past participle



is called 3rd Conditional in grammar and syntax and is used to refer to situations, events etc. which happened in the past, the action is complete and we cannot change it.

Task 4

Mention some cases in which if you or somebody else had behaved otherwise, different results would have followed e.g.

If Athina had taken her umbrella with her, she would have used it when it started to rain.

1.

2.

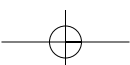
3.

4.

Look at Figure 6.15b. It shows what has happened to the part of grandpa's denture after it has been cleaned with the help of a special cleanser:



Figure 6.15b



The cleanser has removed the plaque.

- a. The cleanser has cleared the stains.
- b. The cleanser has repaired the damaged material.
- c. The cleanser has taken away the toxic substances.
- d. The cleanser has made the denture to look new again.

If we wish to focus not on the cleanser as the doer of the action, but on the effects on the denture, then we must use a different verbal structure which is called passive voice. It is formed with the relevant tense of the verb 'to **be**' (am, is, are, was, were, been) and the past participle of the verb that talks about the event, situation, action, state of mind. In the example above the tense is **Present Perfect**. We need the Present Perfect of the verb to be (have, has been) + the right **past participle** of the main verb e.g.

1. The plaque **has been removed** by the cleanser.

Task 5

Change the remaining sentences into passive. The first part is given to you.

2. The stains
.....
3. The damaged material
.....
4. The toxic substances
.....
5. The denture
.....

