

**BTEC Nationals**

# **IVA – LEARNER INSTRUCTIONS**

**Edexcel Level 3 BTEC National Diploma**

Dental Technology

Unit 2: Dental Technology Techniques (A)  
Unit 18: Integrated Dental Technology Project

**Issued June 2004**

For use during the remainder of the duration of operation  
of the specification issued July 2002



# INSTRUCTIONS FOR LEARNERS COMPLETING IVAs

1. The Integrated Vocational Assignment (IVA) is a compulsory part of your qualification. If you do not complete the IVA you may not receive your certificate.
2. Your tutor(s) will tell you how long you have to complete the IVA and the access you may have to resources.
3. Read the IVA carefully and make sure that you understand the work you should hand in and what is required of you. If you are uncertain, discuss it with your tutor(s).
4. The IVA requires you to work by yourself and to produce original work. You should not share your work with any other learners. For example, if you produce an illustration or diagram electronically, you should not give it to another learner. Similarly, you should not accept and use such information from others. You are required to sign that the work submitted is your own.
5. If you work in a group at any stage, you must present your own responses to each task for assessment.
6. Information taken from sources for research, e.g. internet and textbooks, must be identified and not presented as your own work. You should list the sources used.
7. Some tasks may require Observation Records/Witness Statements. Your tutor(s) will organise for these to be completed and you must attach these to your submitted work.
8. In presenting your final work, you should not include draft work or reference materials such as handouts, notes and leaflets, unless the tasks specifically ask you to do so.
9. Presentation of your work:
  - Check that you have completed all tasks.
  - Label work with the appropriate task/sub task number.
  - Present tasks in the correct order.
  - Label each page with your name and page number.
  - Submit all electronic materials in paper format
  - Clearly label video or audio tapes submitted as part of your assignment.
  - All papers should be securely bound.
  - The completed IVA should NOT be presented in plastic envelopes, a box file or a lever arch file.

# YOUR ASSIGNMENT TASKS

## Scenario

This IVA is a 'vocational project' and it provides the link between the knowledge and understanding developed in units in the programme and the skills required to carry out practical vocational aspects in the workplace, specialist dental technology laboratory, training centre, hospital department etc.

This project explores the technology used in the construction work for of partially and completely edentulous cases, fixed conservation restorations and orthodontics appliance manufacture. It covers the principles of cast production techniques and introduces articulator-mounting systems. It demands an understanding of the requirements of custom-made impression trays, the formation of temporary and permanent denture bases, and occlusal rims for partially dentate and edentulous cases. Forming techniques applied to dental laboratory polymeric materials including the two-part moulding processes for dough moulded permanent prosthesis and the appropriate finishing techniques must be demonstrated.

## TASK 1

### Plan the project

- 1.a Using the information and methods described in the remaining tasks of this assignment, formulate meaningful **aims and objectives** of this vocational investigation and devise an outline plan. In devising your plan, you need to consider for your chosen area being either Prosthetic cases or, Fixed Prosthodontic cases or Orthodontics cases, the:
  - nature of the vocational project
  - availability and sources of information
  - principles of design of the vocational project
  - hazards associated with the practical work
  - sources of mistakes and errors.
- 1.b Analyse the practical tasks, research possible methods and present a detailed plan of the vocational investigation based on clear aims and objectives, and practical content.
- 1.c Independently carry out an analysis of the problem to be addressed for Removable Prosthodontics, Fixed Prosthodontics or Orthodontics case manufacturing and present a detailed plan of the investigation that specifies clearly the aims, objectives and detailed practical work. Your assessor must confirm through use of a checklist and a witness statement whether or not you have demonstrated independence when carrying out sub-task 1.c. A checklist is attached to the Centre Guidance of this IVA.

**This task provides evidence for unit 18 criteria P1, M1, D1.**

## TASK 2

### Research and project execution

- 2.a Collect information from a variety of sources to enable you carry out your plan to complete the practical aspects correctly, safely and with integrity. You need to consider:
- use of a wide range of information sources
  - information relevant to the project
  - recording of sources used in a formal manner
  - the reliability and validity of information
  - health and safety regulations
  - risk analysis
  - safe working practice
  - personal protective equipment.
- 2.b Carry out your vocational project, recording relevant information and observations at appropriate intervals with the required concerns regarding quality assurance and precision in accordance with the plan. You need to:
- assemble equipment and materials
  - follow health and safety procedures
  - demonstrate manipulative skills
  - construct items to achieve results
  - demonstrate observational skills
  - record the results of the processes
- 2.c As you carry out the vocational project, you should review progress at each stage. You should develop the practical components or revise the method as appropriate to provide the required accuracy and precision of information and/or practical components.

**This task provides evidence for unit 18 criteria P2, M2, D2.**

## TASK 3

### Cast production

- 3.a Use Gypsum and/or synthetic stone cast materials to produce **each** of the following cases:
- prosthodontic upper and lower casts
  - orthodontic upper and lower casts
  - sectionalised conservation cast.

To produce these casts you must ensure that you cover the following range of impression pouring techniques:

- manual
- mechanical
- vacuum assisted.

- 3.b Record the manner in which you conduct the Initial preparation and analysis of all the cases, noting:
- procedures for the receipt of the case impressions
  - decontamination procedures
  - impression identification systems
  - analysis of prescription requests
  - identification of types of impressions material and effect on production process
  - general faults
  - methods to produce accurate casts to acceptable impressions
  - selection of suitable forms of cast systems and materials.
- 3.c Record the manner in which you prepare and cast the cases from diagnostic, study and working impressions, noting:
- equipment selected
  - types of materials selected
  - mixing systems used
  - impression pouring techniques.
- 3.d Demonstrate good working practices and procedures in the removal and disposal of redundant and used impressions.
- 3.e Trim working casts:
- prosthetic casts to enable appropriate working,
  - orthodontic casts trimmed to conventional angles
  - sectionalised conservation casts to enable as a minimum one die removal and its accurate replacement.
- 3.f Your assessor must confirm whether or not you have required minimal guidance to carry out sub-tasks 3.a – 3.e.
- 3.g Your assessor must confirm whether or not you have demonstrated applied skills and independence when carrying out sub-tasks 3.a – 3.e.

**This task provides evidence for unit 2 criteria P1, M1, D1.**

## **TASK 4**

### **Analyse the cases prior to construction of Impression Trays**

- 4.a Determine and record the type of impression-taking technique to be used in responding to the prescription information.
- 4.b You must make a record of at least the following features of the casts, noting:
- anatomical factors related to peripheral outline
  - major anatomical features usually seen on casts
  - the clinical surfaces of primary casts to determine suitability
  - the determination of the peripheral extension delineation.
- 4.c Your assessor must confirm whether or not you have required minimal guidance to carry out sub-tasks 4.a & 4.b
- 4.d Your assessor must confirm whether or not you have demonstrated applied skills and independence when carrying out sub-tasks 4.a & 4.b

**This task provides evidence for unit 2 criteria P2, M2, D2.**

## **TASK 5**

### **Constructing Custom made impression trays**

- 5.a Produce a partially dentate and an edentulous custom-made impression tray using a variety of impression tray construction materials. For the production of each impression tray record the:
- design features
  - muco static and muco compressive impression system requirements
  - selection of construction materials
  - Standard Operating Procedures (SOP's) for construction of various trays
  - spacers related to impression material, if required
  - handle types and forms, and reasons for their use
  - retention systems for impression materials
  - construction quality features required for each case
  - health and safety procedures
  - personal protective equipment requirements.
- 5.b Record the final assessment, modifications made and decontamination for each of the custom-made impression trays. You should note:
- preparation for and final check of the impression trays
  - patient identification linked to specific impression trays
  - reasons for quality checks
  - how MDD requirements are complied with
  - prescription requirement final checks
  - pre quality checks by trainee, and liaison with the quality check individual.

- 5.c Your assessor must confirm whether or not you have required minimal guidance to carry out sub-tasks 3.a & 3.b.
- 5.d Your assessor must confirm whether or not you have demonstrated applied skills and independence when carrying out sub-tasks 5.a & 5.b.

**This task provides evidence for unit 2 criteria P3, M3, D3.**

## **TASK 6**

### **Temporary and Permanent Base manufacture**

- 6.a With guidance, show evidence of planning and safe working practices when designing and constructing temporary or permanent bases for partially dentate and edentulous patient cases. You need to consider the:
- range of factors that need to be taken into account when performing general cast analysis of each case
  - requirements for temporary and permanent bases for each case
  - requirements for both temporary and permanent bases, and the reasons for these when currently used with wax record rims.
- 6.b Your assessor must confirm through whether or not you have required minimal guidance to carry out sub-task 6.a.
- 6.c Show applied skills and competence in the independent planning, design and construction of temporary or permanent bases for partially dentate and edentulous cases (these to incorporate patient identification). Your assessor must confirm whether or not you have demonstrated applied skills and independence when carrying out sub-task 6.a.

## **TASK 7**

### **Occlusal Rims**

- 7.a With guidance, show evidence of planning and safe working practice when designing and constructing occlusal rims upon temporary or permanent bases for partially dentate and edentulous cases.
- 7.b With minimal guidance, show planning and safe working practices when designing and constructing occlusal rims upon temporary or permanent bases for partially dentate and edentulous cases. Your assessor must confirm whether or not you have required minimal guidance to carry out sub-task 7.a.
- 7.c Demonstrate applied skills and competence in the independent planning, design and construction of occlusal rims upon temporary and permanent bases for bases for partially dentate and edentulous cases. Your assessor must confirm whether or not you have demonstrated applied skills and independence when carrying out sub-task 7.a.

**This task provides evidence for unit 2 criteria P5, M5, D5.**

## **TASK 8**

### **Applied Dental Articulator use**

- 8.a Identify some of the main features of dental articulators and show the ability to prepare them for use; mount cast cases on an articulator and with guidance, set and transfer clinical information to the casts. You need to consider the theoretical areas of:
- the major forms of dental articulators, their movements and reasons for use
  - adjustments to articulators that are essential and/or optional
  - mounting systems
  - articulation of edentulous cast cases.
  - accurate location and relocation system
  - basic settings to confirm accuracy
  - assessment of the mounted cases prior to further manufacturing use.
- 8.b Identify the main features of dental articulators, select and prepare appropriate types of articulator for an edentulous case and a partially edentulous case as a range of cases. Apply practical techniques when mounting cases on a variety of articulators; with minimal guidance accurately set the articulators and transfer the clinical information to the casts.
- 8.c Your assessor must confirm whether or not you have required minimal guidance to carry out sub-task 8.a and 8.b.
- 8.d Define the main features of dental articulators, select and evaluate appropriate forms for a range of cases with competence, by independent planning and accomplished techniques when mounting casts on a variety of articulators; with competence, accurately set the articulator and transfer the clinical information to the casts. Your assessor must confirm whether or not you have demonstrated accomplished techniques and independence when carrying out sub-tasks 8.a and 8.b.

**This task provides evidence for unit 2 criteria P6, M6, D6.**

## **TASK 9**

### **Analysis, evaluation, conclusion**

9.a Choose one of your prepared cases to be the focus of your own project in either Removable Prosthodontics, or Fixed Prosthodontics or Orthodontics. Using standard operating procedure methods process correctly the information retrieved from the case, supplementary evidence available, and analyse the practical aspects of your vocational work and other factual sources. For the information that you have retrieved, you need to consider:

- the relevance to your investigation
- summarising the information
- the use of information to support your vocational work
- aspects where further information from others is essential to assist in manufacturing the case.

For the aspects of practical application, you need to consider:

- MDD requirements in accepting and progressing the case of your choose through to final quality check
- organisation of components of the practical aspect
- standard operating procedures and Health and Safety requirements
- organisation of components of the practical aspect
- methods of applying vocational skills
- analysis of the completed practical aspect using the range of methods
- assessment of the accuracy and precision of the practical component of the project
- written evidence of consideration and evaluation of alternative methods of manufacture
- analysis of the end products as part of an applied quality assurance assessment.

9.b Draw valid conclusions from an independent evaluation and analysis of the research information and from the outcomes of the practical activity. The information may be drawn from the practical component completed by the individual learner and others that have appropriate vocational knowledge.

9.c Independently evaluate and analyse your findings, showing clearly the extent to which your aims and objectives were met and how your practical application addressed the underlying technical principles.

9.d Your assessor must confirm whether or not you have demonstrated independence when carrying out sub-tasks 9.c.

**This task provides evidence for unit 18 criteria P3, M3, D3.**

**TASK 10**  
**Report presentation**

- 10.a Present the completed practical case as ready for dispatch to the clinic, and your results and conclusions in an appropriate, formal written format using correct technical language. You need to consider:
- the structure and format of the report
  - use of correct and precise technical language
  - use of appropriately sized and labelled images and your line drawings
  - compilation of bibliography in an accepted formal manner
  - evaluation of results
  - drawing of conclusions
  - evaluation of the achievement of the objectives
  - using the range of presentation methods appropriately.
- 10.b Your report should show clearly how the investigation was based on the application of vocational principles to a particular aspect of technical work.
- 10.c To demonstrate a higher level of achievement for this task, you must independently produce a project that links the application of the vocational and theoretical aspects.
- 10.d Your assessor must confirm whether or not you have demonstrated independence when carrying out sub-tasks 10.c.

**This task provides evidence for unit 18 criteria P4, M4, D4.**

## ASSESSMENT CRITERIA

For ease of reference, the assessment criteria from the unit specifications that are relevant to assessing and grading this IVA are repeated below. You should refer to the full unit specification for information on unit content.

### Assessment Evidence Unit

<b>Unit 2: Dental Technology Techniques (A)</b>		
<b>To achieve a pass grade the evidence must show that the learner is able to:</b>	<b>To achieve a merit grade the evidence must show that the learner is able to:</b>	<b>To achieve a distinction grade the evidence must show that the learner is able to:</b>
<ul style="list-style-type: none"> <li>with guidance, show planning and good practices when using manual, mechanical and vacuum assisted impression pouring techniques; remove impression material from poured casts (preserving cast integrity); trim casts for prosthodontic, orthodontic and sectionalised conservation casts</li> <li>identify and respond to prescription information in order to determine the type of impression-taking technique being used and, with guidance, propose viable designs for the type of impression tray(s) required</li> </ul>	<ul style="list-style-type: none"> <li>with minimal guidance, show planning, and safe working practices when using manual, mechanical and vacuum assisted impression pouring techniques; remove impression material from poured casts (preserving cast integrity); trim casts for prosthodontic, orthodontic and sectionalised conservation casts</li> <li>with minimal guidance, effectively use and interpret the prescription information to determine the type of impression-taking technique being used and propose viable designs for the type of impression tray(s) required</li> </ul>	<ul style="list-style-type: none"> <li>show applied skills, competent practices and independent planning when using manual, mechanical and vacuum assisted impression pouring techniques; remove impression material from poured casts (preserving cast integrity); trim casts for prosthodontic, orthodontic and sectionalised conservation casts</li> <li>thoroughly understand and interpret the prescription information to determine the type of impression-taking technique being used and independently propose viable designs for the type of impression tray(s) required</li> </ul>

## Assessment Criteria Continued...

<b>Unit 2: Dental Technology Techniques (A)</b>		
<b>To achieve a pass grade the evidence must show that the learner is able to:</b>	<b>To achieve a merit grade the evidence must show that the learner is able to:</b>	<b>To achieve a distinction grade the evidence must show that the learner is able to:</b>
<ul style="list-style-type: none"> <li>with guidance, show planning and good practice when constructing partially dentate and edentulous custom-made impression trays in a variety of materials and designs</li> <li>with guidance, show evidence of planning and safe working practices when designing and constructing temporary or permanent bases for partially dentate and edentulous cases</li> <li>with guidance, show evidence of planning and safe working practice when designing and constructing occlusal rims upon temporary or permanent bases partially dentate and edentulous cases</li> <li>identify some of the main features of dental articulators and show the ability to prepare them for use; mount casts on an articulator and with guidance, set and transfer clinical information to the casts.</li> </ul>	<ul style="list-style-type: none"> <li>construct partially dentate and edentulous custom-made impression trays in a variety of materials and designs with minimum guidance</li> <li>with minimal guidance, show planning and safe working practices when designing and constructing temporary or permanent bases for partially dentate and edentulous cases (these to incorporate patient identification)</li> <li>with minimal guidance, show planning and safe working practices when designing and constructing occlusal rims upon temporary or permanent bases for partially dentate and edentulous cases</li> <li>identify clearly the main features of dental articulators, select and prepare appropriate types for a range of cases and applied techniques when mounting cases on a variety of articulators; with minimal guidance accurately set the articulator and transfer the clinical information to the casts.</li> </ul>	<ul style="list-style-type: none"> <li>show applied skills and competence in the independent construction of partially dentate and edentulous custom-made impression trays in a variety of materials and designs</li> <li>show applied skills and competence in the independent planning, design and construction of temporary or permanent bases for partially dentate and edentulous cases (these to incorporate patient identification)</li> <li>show applied skills and competence in the independent planning, design and construction of occlusal rims upon temporary and permanent bases for bases for partially dentate and edentulous cases</li> <li>define the main features of dental articulators, select and evaluate appropriate forms for a range of cases with competence, independent planning and accomplished techniques when mounting casts on a variety of articulators; with competence, accurately set the articulator and transfer the clinical information to the casts.</li> </ul>

# ASSESSMENT CRITERIA

For ease of reference, the assessment criteria from the unit specifications that are relevant to assessing and grading this IVA are repeated below. You should refer to the full unit specification for information on unit content.

## Assessment Evidence Unit

<b>Unit 18: Integrated Dental Technology Project</b>		
<b>To achieve a pass grade the evidence must show that the learner is able to:</b>	<b>To achieve a merit grade the evidence must show that the learner is able to:</b>	<b>To achieve a distinction grade the evidence must show that the learner is able to:</b>
<ul style="list-style-type: none"> <li>• use given information and methods to formulate meaningful aims and objectives of the vocational investigation and devise an outline plan</li> <li>• using given methods carry out their plan to collect information from a variety of sources correctly, safely and with integrity and to complete the practical aspects</li> <li>• using given methods process correctly the information retrieved, and analyse the practical aspects of their vocational work and other factual sources</li> <li>• present their results and conclusions in an appropriate format and use correct technical language.</li> </ul>	<ul style="list-style-type: none"> <li>• analyse the problem, research possible methods and present a detailed plan of the vocational investigation based on clear aims and objectives, and practical content</li> <li>• carry out their selected plan, recording relevant information/observations at appropriate intervals with the required concerns regarding quality assurance and precision in accordance with their plan</li> <li>• draw valid conclusions from their independent evaluation and analysis of the information and the practical component by themselves and others who have appropriate vocational knowledge</li> <li>• show clearly how their investigation was based on the application of vocational principles to a particular aspect of technical work.</li> </ul>	<ul style="list-style-type: none"> <li>• independently carry out an analysis of the problem to be addressed and present a detailed plan of the investigation which specifies clearly the aims, objectives and detailed practical work</li> <li>• carry out their plan, reviewing progress at each stage and developing the practical components or revising the method as appropriate to provide the required accurate and precise information and/or practical component</li> <li>• independently evaluate and analyse their findings, showing clearly the extent to which their aims and objectives were met and how their practical application addressed the underlying technical principles</li> <li>• provide independently a project that links the application of the vocational and theoretical aspects.</li> </ul>