DA 106 Dental Materials for the Dental Assistant Lesson Plan

Lesson Plans

Dental Material for the Dental Assistant

Course Objective/Outcomes

At the end of each course, the student will be able to understand and explain the following:

1. Explain the role of the dental assistant while utilizing a variety of dental materials in providing safe patient-centered care.
2. Demonstrate current acceptable aseptic technique in the laboratory and clinical setting.
3. Explain the types, indications, and usage of dental materials.
4. Identify the types of dental cements.
5. Explain the properties, composition, uses, and manipulation of dental cements.
6. Describe the terminology and steps of cavity preparation.
7. Describe bonding agents and their manipulation.
8. Explain composition and manipulation of composite resins.
9. Explain the use of glass ionomers, resin, resin-reinforced glass ionomers, and compomer restorative materials.
10. Demonstrate knowledge and skill needed to prepare, take and remove alginate impressions and wax bite registrations.
11. Demonstrate knowledge and skill necessary to prepare reversible hydrocolloid impression material for the dentist.
12. Demonstrate knowledge and skill necessary to use gypsum products.
13. Demonstrate knowledge and skill necessary to pour and trim a diagnostic cast.
14. Identify use of a dental articulator.
15. Identify various classifications and uses of waxes used in dentistry.
16. Explain the composition and setting properties of amalgam alloy.
17. Demonstrate appropriate mercury hygiene and safety utilizing evidence-based practices.
18. Identify the purpose of custom trays and wax rims and the materials used for construction.
19. Demonstrate the fabrication of bleaching trays, mouth guards, and tooth print IDs.

Instructor Notes – prepare/bring for class

- Computer, projector, screen available
- Ice breaker activity
- Text, workbook, instrument book
- Power Points
- Worksheets
- Visual Aids

Teaching Strategies

This lesson plan is designed to be used in conjunction with the course text, workbooks, handouts, PowerPoints, videos, online resources, and case studies to create an engaging and effective learning environment. This lesson plan is to guide and help focus the instructor during lesson planning. Some material will be revisited, in depth, in future courses.

Throughout the lesson plan, points to become familiar with are bulleted, along with the chapter and page number where the material is found. Use creative teaching methodologies for diverse learning styles. Assignments are italicized.

This lesson plan has been designed to engage in student learning, verify student understanding of content, and enable mastery of content. Lessons are divided into: Present, Engage, and Assess, Reflect.

- **Present:** Deliver key knowledge to be mastered
- **Evaluate:** Confirm understanding, answer and clarify all misinterpretations
- **Engage:** Provide opportunities to re-enforce key knowledge
- **Assess:** Demonstrate mastery of content by completing assessments tied to course material

Classroom Session

Course Introduction

1. Introduce yourself
2. Explain classroom/lab rules and reminders (late assignments, participation, uniforms, etc)
3. Review class syllabus and designate reading assignment requirements
4. Key terms
5. Discuss how this course will relate to their careers in dentistry
6. End each classroom session with student recollection

Basic Core Content: Didactic, Core Content: Laboratory/Clinical Practice

Present

Week 1 CADM Ch. 1, 2, 3

1. Introduction to dental materials pg 4-16

    a. Rationale for study

    b. Materials and the oral environment

    c. Historical aspects

d. Standards for dental materials

e. Classification of materials

f. **Evaluate**

2. Materials science pg 22-30

a. Materials science (definitions)

b. Atomic bonding

c. Materials and their atomic bonding

d. **Evaluate**

3. Physical and mechanical properties of dental materials 34-43

a. Properties of materials defined

b. Physical properties (density, vapor pressure, thermal conductivity, etc.)

c. Mechanical properties (elasticity, stress, strain, e t c.)

d. **Evaluate**

Engage:

Assign CADM Ch 1 Review Questions 1-12

Lab Activities

1. Staff Introduction
2. Introduction to Lab
3. Personal Protection and Equipment: MDA Ch. 19 pg 301-308
    a. Applying First Aid After an Exposure Incident
    b. Handwashing Before Gloving
    c. Applying Alcohol-based Hand Rubs
    d. Putting on Personal Protective Equipment
    e. Removing Personal Protective Equipment
    f. Evaluate

Present:

Week 2 CADM Ch 20, 21 MDA Ch 47

4. Laboratory Materials MDA Ch 47 pg 784-785

a. Safety in the dental laboratory

b. Dental laboratory equipment

c. **Evaluate**

5. Infection control and safety MDA pg 288-292, CADM Ch 21 pg 288-291

a. Disinfection of impressions

b. Disinfecting dentures and other appliances

c. Infection control protocol for laboratory procedures

d. Physical hazards (lathes, model trimmers, respiratory, etc.) CADM Ch 20 pg 277-283

e. Chemicals

f. MSDS sheets

g. **Evaluate**

Engage:

Assign Infection Control Case Study. If time is allowed, complete in class and have an open discussion.

Lab Activities:

1. Lab Rules
   a. Infection control
   b. Safety attire
   c. Ventilation
   d. Care of dental material equipment
2. Review PPE

***Assess*: Students to complete evaluations of PPE. Forms located in MDA Workbook Ch 19**

Present:

Week 3 CADM Ch 8 MDA Ch 46, 47

6. Impression Materials CADM 112-126 MDA 762-773, 791-793

a. Background information (available systems, trays, cost)

b. Classification

c. ZOE impression material

d. Hydrocolloid impression material

(1) Irreversible

(2) Reversible

e. Elastomeric (rubber) impression materials

f. Dental waxes

g. **Evaluate**

7. Gypsum materials MDA pg 787-788, 795 CADM 130-137

a. Properties

b. Types

(1) P l a s t e r

(2) Stone

(3) Improved stone

c. Setting reaction

d. Water/powder ratio

e. Setting time

f. Properties

g. Technique of use

h. **Evaluate**

Engage:

Assign Impressions Case Study, completed as out-of-class work

Assess:

Administer Quiz 1 on material covered in CADM Ch 1, 2, 3, 20, 21, 8. MDA Ch 19, 47, 46

Lab Activities:

Week 3, 4, and 5 CADM Ch 27, 28

1. **Taking Alginate Impressions pg 338-334**
    a. **Purpose**
    b. **Selection**
    c. **Preparation of the Patient**
    d. **The alginate Impression**
2. **Fabrication and Trimming of Alginate Impressions pg 346-356**
    a. **Purpose**
    b. **Construction of a Study Model**
    c. **Trimming Diagnostic Casts or Study Models**
    d. **Evaluate**

Assess: Students to complete evaluations on taking alginate impressions and wax bites. Forms located MDA Workbook Ch 46 pg 423-438. To be completed by week 5.

Students to complete evaluation on the fabrication of alginate impressions. Forms located MDA Workbook Ch 47 pg 447-455. To be completed by week 8

Present:

Week 4 CADM Ch 16, MDA Ch 58

8. Polishing materials and abrasion CADM Ch 16, pg 214-219, MDA Ch 58 pg 981-990

a. Definitions

b. Types of abrasives

c. Bonded and coated abrasives

d. Factors affecting the rate of abrasion

e. Polishing process

(1) Reasons to polish

(2) Selective polishing

f. **Evaluate**

Engage:

Assign MDA Workbook Ch 58 Fill-In-The-Blank, Multiple-choice Questions, and Case Study activity

Lab Activities:

Week 6 MDA Ch 58 pg 992-994 MDA Ch 46 780-782

1. **Demo on polishing**
2. **Student to practice polishing on Typodont**
3. **Demonstration on Wax Bite Registrations**

Engage:

Assign Comparisons of Polishing Products as out of class work.

Present:

Week 5 MDA Ch 59

9. Pit and fissure sealants MDA pg 995-1001

a. Purpose and indications

b. Contraindications

c. Procedure

d. Post-sealant evaluation

e. **Evaluate**

Engage:

In class have students watch YouTube videos on sealant placement
https://www.youtube.com/watch?v=Twxd7v9zlE4

Lab activities:

Week 7

1. Continue Model Trimming
2. Sealant Demo on Extracted Teeth
3. Student to place sealant on extracted tooth

Present:

Week 6 MDA Ch 48, CADM Ch 17, 31

10. Tooth whitening MDA Ch 48 pg 813-816, CADM Ch 17, 31 pg 234-242, 372-382

a. Treatment options

b. Causes of tooth discoloration

c. Whitening agents

d. Whitening techniques

e. Side effects of whitening

f. **Evaluate**

Engage:

Assign in D2L discussion, post Teeth Whitening

Assess:

Administer Quiz 2 on material covered in CADM Ch. 16, 17, 31. MDA Ch. 58, 59, 48

Lab Activities:

Week 8

1. Continue Model Trimming
2. Assign Bleaching Assignment

3. Bleaching Tray Demo

Assess: Student to complete evaluation on constructing a vacuum-formed custom tray. Form located MDA Workbook Ch 47 pg 463

Present:

Week 7 CADM Ch 19, 22, 23

12. Instruments as dental materials pg 256-263

    a. Composition of instruments

    b. Problems of instruments

    c. Instrument inspection

    d. Sharpening instruments

        (1) Why sharpen?

        (2) Frequency

    e. **Evaluate**

13. Mixing Liners, Bases, and Bonding Systems pg 294, 300-307

    a. Purpose

    b. Calcium Hydroxide

    c. Zinc Phosphate Cement

    d. Glass Ionomer

    e. Zinc Oxide

    f. Temporary Cement

    g. Resin composite cement

    h. **Evaluate**

Lab Activities:

Week 9 MDA Ch 44 pg 742-749

1. Continue fabrication of bleaching tray
2. Demonstrate mixing liners, bases, and bonding
3. Complete evaluations on model trimming

Present:

Week 8 CADM Ch 5, 6

14. Direct polymeric restorative materials CADM Ch 5 pg 62-78

a. Acrylic resins

(1) Steps in addition polymerization

(2) Activation “options” of addition polymerization

b. Problems with unfilled resins

c. Improvements to dental resins

d. Composite materials

(1) Components of composites

(2) Polymerization systems

(3) Types and properties of dental composites

(4) Uses

(5) Factors affecting use

(6) Placement

e. Pit and fissure sealants

f. Preventive resin restorations

g. Composite Cements

h. Glass ionomer materials

i. Compomers

j. **Evaluate**

15. Amalgam and direct metallic restorative materials CADM Ch 6 pg 82-91

a. Amalgam defined

b. Advantages of using amalgam

c. History of amalgam

d. Low copper dental amalgam

e. High copper dental amalgam

f. Factors affecting handling and performance

g. Amalgam properties (strength, creep corrosion, e t c .)

h. Use of dental amalgam

(1) Effect of moisture

(2) Finishing and polishing

(3) Mercury toxicity

i. Direct gold restorations (gold foil)

j. **Evaluate**

Assess:

Administer Midterm Exam

Lab Activities:

Week 10

1. Complete bleaching tray
2. Fabrication of mouthguards/sports guards

Present:

Week 9 MDA Ch 49, CADM Ch 15

16. Matrix Systems for Restorative Dentistry MDA Ch 49 pg 828-834

a. Posterior matrix systems

b. Anterior matrix systems

c. Alternative matrix systems

d. **Evaluate**

17. Radiographic appearance of dental tissues and m a t e r i a l s CADM Ch 15 pg 203-210

a. Rationale for integrating radiology and dental materials

b. Restorative materials categorized by radiographic appearance

c. Radiographic descriptions of dental tissues and materials

d. **Evaluate**

Engage:

Assign MDA Workbook Ch 49 Short-Answer Questions 1-5

Lab Activities:

Week 11

1. Continue fabrication of mouthguards
2. Demo on matrix system

Present:

Week 10 MDA Ch 51, CADM Ch 7

18. Provisional Coverage MDA Ch 51 pg 859-870

a. Categories of provisional coverage

b. Criteria for provisional fabrication

c. Home care instructions

d. Removal

e. **Evaluate**

19. Dental cements CADM Ch 7 pg 96-108

a. Uses

(1) Luting agents

(2) Pulp protection

(3) Temporary restoration

(4) Cavity sealers

b. Chemistry

c. Powders used in dental cements

d. Liquids used in dental cements

e. Powder/liquid ratios and systems of dental c e m e n t s

f. Z O E c e m e n t

g. Zinc phosphate cement

h. Glass ionomer cement

i. Polycarboxylate cement

j. Composite cement

k. Other cements and uses

l. **Evaluate**

Engage:

Assign MDA Ch 51 Short-Answer Questions and Case Study Exercise

Lab Activities:

Week 12 Ch 50, 51

1. Complete Mouthguards
2. Discuss placing and removing gingival retraction cord pg 852-854
3. Demo on fabricating and cementing a preformed provisional crown pg 865-870

Present:

Week 11 CADM Ch 4, 18

20. Adhesive materials CADM Ch 4 pg 48-58

a. Adhesive materials in dentistry

(1) Adhesion/bonding

(2) Development

(3) Surface Factors

b. Acid etching

c. Dentinal bonding

d. Glass ionomers

e. **Evaluate**

21. Oral Appliances CADM Ch 18 pg 246-252

a. Types

b. Material used in fabrication

c. Fabrication of an oral appliance

d. Maintenance of oral appliances

e. **Evaluate**

Lab Activities:

Week 14

Assess: Student to complete evaluation on fabricating and cementing a preformed provisional crown. Form located MDA Workbook Ch 51 pg 511.

Present:

Week 12 MDA Ch 50, 52

22. Materials for fixed indirect restorations/prostheses MDA Ch 50 pg 840-858

    a. Plan of Care

    b. Indirect restorations

    c. Role of the dental laboratory technician

    d. Overview of a crown procedure

    e. Overview of a bridge procedure

    f. Computer-assisted restorations

    g. **Evaluate**

23. Removable prostheses and acrylic resins MDA Ch 52 pg 872-885

    a. Factors influencing the choice of a removal prosthesis

    b. Removable partial denture

    c. Complete dentures

    d. Immediate dentures

    e. Overdentures dentures

    f. Adjustment and relining a denture

    e. Denture repairs

    g. **Evaluate**

Assess:

Administer Quiz 3 on material covered in CADM 15, 7, 4, 18. MDA Ch.4, 51,

Present:

Week 13 MDA Ch 53

24. Dental Implants MDA Ch 53 pg 887-898

a. Indication for implants

b. Contraindication to implants

c. The dental implant patient

d. Preparation for implants

e. Types of dental implants

f. Maintenance of Dental Implants

g. **Evaluate**

Present:

Week 14 CADM Ch 13

25. Specialty materials Ch 13 pg 180-190

a. Orthodontic materials

b. Endodontic materials

c. Periodontal and other surgical materials

d. Pediatric dentistry

e. **Evaluate**

Assess:

Administer Final Exam