

# Dental Science

<b>Dress Code</b>	Attire appropriate to the occupational area
<b>SLC Orientation</b>	Event explained to the competitors and individual time cards handed out. Students will return to the event room at least 5 minutes before their allotted time. <b>Students will have a secret scenario to solve when it is their turn to compete. Students should not share the secret scenario when they leave the event as it is an automatic disqualification.</b>
<b>Round # 1</b>	Competitors must submit technical skill video to Montana HOSA by deadline. Additionally, competitors will take an online test during the testing window. Advisors will be informed of which competitors have moved on from Round 1 to qualify to participate in Round 2 at SLC.
<b>Round # 2</b>	Skill procedures from rubric guidelines will be performed by each competitor. Competitors may be asked to do one or multiple of the performance skills.
<b>Scoring</b>	Round 1 online testing scores will be combined with Round 2 skill procedures for a total score.

## Official References

The below references are used in the development of the test questions and skill rating sheets unless otherwise noted.

- a. [Boyd, Linda. \*Dental Instruments: A Pocket Guide\*. Saunders, latest edition.](#)
- b. [Robinson, Debbie S. \*Modern Dental Assisting\*. Elsevier, latest edition.](#)
- c. [Simmers, L., Simmers-Narker, Simmers-Kobelak. \*DHO: Health Science\*. Cengage Learning, Latest edition.](#) (SKILLS ONLY)

## Round One Test

[Test Instructions:](#) The written test will consist of 50 multiple-choice items in a maximum of 60 minutes.

## Written Test Plan

The test plan for Dental Science is:

- The Dental Team, Dental Specialties, and History - 10%
- DENTAL Anatomy and Physiology - 10%
- Dental Pathology - 10%
- Tooth Morphology - 10%
- Infection Control / Occupational Health and Safety - 10%
- Chairside Assisting/Instruments (Including Restorative and Laboratory Materials) - 30%
- Radiology - 10%
- Medical Emergencies in the Dental Office - 10%

### Sample Round One Test Questions

1. What is the term for the area where two bones fused to form the joint at the mandible? (Robinson pp 88)
  - A. Condyles
  - B. Ramus
  - C. Coronoid notch
  - D. Symphysis**
2. Which instruments are best suited for examining teeth for caries, calculus, furcations or other abnormalities? (Boyd pp 5)
  - A. Dull chisels
  - B. Ball burnishers
  - C. Explorers**
  - D. Scalpels
3. In the dental unit, what does the rheostat control? (Robinson pp 438)
  - A. Air-water syringe
  - B. Speed of the handpiece**
  - C. Position of the head of the dental chair
  - D. Overhead lights

### Round Two Skills

Round Two is a selected skill(s) performance. The Round Two skills approved for this event are:

Skill I: Dental Instrument Identification (*Including name of instrument and purpose or use*) 15 minutes  
15 instruments or photos from the following list:

Amalgam Carrier – Double Ended	Burs – Pear-Shaped	Elevators - Straight	Rongeurs
Amalgam Condenser	Burs – Inverted Cone	Endodontic Explorer	Scaler-Straight Sickle
Amalgam Well	Burs – Finishing	Evacuation Tip High-Volume	Scaler-Curved Sickle
Anesthetic Aspirating Syringe	Burs - Diamond	Forceps- Mandibular Universal – Cryer 151	Scissors – Crown & Bridge
Articulating Paper Holder with paper	Burs - Round	Forceps- Maxillary Universal – Cryer 150	Scissors – Suture
Bird Beak Pliers	Carvers- Discoid-Cleoid	Handpieces -Fiberoptic High-Speed	Spoon Excavator
Bite-Wing Tabs	Carvers - Hollenback	Handpieces – High-Speed	Tongue & Cheek Retractor
Bone File	Composite Placement Instrument	Handpieces – Slow Speed with Contra Angle Attachment	Universal Matrix Band
Burnisher – Ball	Cotton Forceps (pliers)	Handpieces – Slow Speed with Prophy Angle Attachment	Universal Clamps – Mandibular (Winged Clamp)
Burnisher - Football	Curing Light	Hemostat	Universal Clamps – Mandibular (Wingless Clamp)
Burnisher – T- Ball	Dental Dam Forceps	Howe (or How) Pliers	Universal Clamps – Maxillary (Winged Clamp)
Burnisher – Acorn	Dental Dam Punch	Liner Applicator	Universal Clamps – Maxillary (Wingless Clamp)
	Elevators – Root-Tip	Periodontal Probe	

Skill II:	Assembly and Disassembly of the Aspirating Anesthetic Syringe	7 minutes
Skill III:	Seat, Prepare, and Dismiss Patient for Periodic Oral Evaluation	10 minutes
Skill IV:	Placing & Removing Surface Barriers	7 minutes
Skill V:	Oral Hygiene Instruction: Brushing and Flossing	7 minutes
Skill VI:	Preparation, Manipulation, Delivery, & Handling of Alginate Impressions	7 minutes
Skill VII:	Operating the Ultrasonic Cleaner	5 minutes

Skill VIII: Personal Protective Equipment (PPE): Donning and Doffing

5 minutes

The selected Skill(s) will be presented to competitors as a written scenario at the beginning of the round. The scenario will be the same for each competitor. Some scenarios may involve the combination of multiple skill sheets, in which case some elements may not be scored due either to being duplicative or not appropriate within the scenario. A sample scenario can be found [here](#).

Timing will begin when the scenario is presented to the competitors, and competitors will be stopped at the end of the time allowed.

The scenario is a secret topic. Competitors MAY NOT discuss or reveal the secret topic until after the event has concluded or will face penalties per [the GRRs](#).

Judges will provide competitors with information as the rating sheets directed. Competitors may ask questions of the judges while performing skills if the questions relate to the patient's condition and will be included in the scenario or the judge's script.

**Competitors Must Provide:**

- Disposable non-latex gloves, and utility gloves
- Disposable mask and gown
- Protective eyewear for the competitor

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## SKILL I: DENTAL INSTRUMENT IDENTIFICATION

Time = 15 minutes

Competitor ID #: \_\_\_\_\_ Judge's Initials: \_\_\_\_\_ Total Points (45 possible): \_\_\_\_\_

	Name of Instrument	Points (1 each for name & spelling)	Purpose or Use	Points (1 point for correct purpose/use)
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
<b>TOTAL: ID &amp; Spelling (30 poss)</b>			<b>TOTAL: Purpose (15 poss.)</b>	

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Section # \_\_\_\_\_  
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Division: \_\_\_\_\_ SS \_\_\_\_\_ PS/C \_\_\_\_\_  
 Judge's Signature \_\_\_\_\_

<b>Skill II: Assembling &amp; Disassembling the Aspirating Anesthetic Syringe (Time: 7 minutes)</b>		<b>Possible</b>	<b>Awarded</b>
1.	Washed hands or used alcohol-based hand-rub for hand hygiene.	2	0
2.	Donned, gown, surgical mask, protective eyewear, and gloves.	2	0
3.	Obtained disposable needle and the anesthetic specified by the scenario.	2	0
4.	Checked the carpule.	2	0
	a. Noted color of solution and presence of any bubbles.	2	0
	b. Noted medication expiration date.	2	0
	c. Noted the condition of the aluminum cap and condition of the glass.	2	0
	d. Wiped the rubber diaphragm on the aluminum cap and the plunger end of the carpule with alcohol wipe.	2	0
5.	Checked the syringe and noted condition of harpoon and other parts.	2	0
6.	Placed fingers and thumb on the thumb ring and finger grip.	1	0
7.	Retracted the piston all the way back.	1	0
8.	Placed the carpule in the syringe, with the plunger end going into the harpoon. The aluminum cap end will fall into place.	1	0
9.	Engaged the harpoon into the rubber plunger using moderate pressure on the thumb ring to push the piston forward until the harpoon is firmly engaged.	1	0
10.	Placing the Needle on the Syringe	2	0
	a. Broke the seal on the needle and removed the protective cap from the needle. (Protective guard – clear plastic is removed. The needle guard is not removed.)	1	0
	b. Screwed the needle into position on the syringe.	1	0
	c. Verified the needle is straight and firmly attached.	1	0
	d. Placed the prepared syringe on the tray ready for use.	1	0
	e. Syringe placed out of the patient's site.	1	0
	<b>Judge states, "procedure is completed."</b>	2	0
11.	Removed the used needle with the needle guard.	2	0
12.	Discarded needle in sharps container.	2	0

<b>Skill II: Assembling &amp; Disassembling the Local Aspirating Syringe (con't)</b>	<b>Possible</b>	<b>Awarded</b>
13. Disposed of other used equipment and supplies.	2 0	
14. Removed examination gloves without contamination.	2 0	
15. Put on utility gloves.	2 0	
16. Cleaned and disinfected the work area.	2 0	
17. Removed and cleaned utility gloves.	2 0	
a. Washed with soap and water under faucet.	2 0	
b. Removed and disinfected utility gloves with surface disinfectant.	2 0	
18. Removed PPE and discarded in regular trash container.	2 0	
19. Washed hands or used alcohol based hand-rub for hand hygiene.	2 0	
<b>TOTAL POINTS - SKILL II</b> <b>70% Mastery for Skill II = 36.4</b>	<b>52</b>	

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<b>Skill III: Seat, Prepare and Dismiss Patient for Periodic Oral Evaluation (Time: 10 minutes)</b>	<b>Possible</b>		<b>Awarde d</b>
1. Ensured that the treatment room was properly cleaned and prepared.	1	0	
2. Properly positioned chair and ensured the path was clear for patient to enter.	2	0	
3. Performed instrument setup and placed materials per scenario.	1	0	
4. Identified and greeted patient appropriately.	2	0	
a. Greeted in courteous manner.	1	0	
b. Made eye contact and smiled.	2	0	
c. Introduced self.	1	0	
5. Escorted patient to the treatment area.	1	0	
6. Placed the patient's personal items in a safe place within the treatment room.	1	0	
7. Initiated conversation with patient and asked if they have any questions about scheduled treatment.	2	0	
8. Seating patient:	1	0	
a. Instructed patient to sit on side of the dental chair and then swing their legs onto the base of the chair.	1	0	
b. Placed the chair arm into position.	1	0	
c. Instructed patient to slide up in chair until head even with the top of the headrest.	1	0	
9. Placed the disposable patient napkin over the patient's chest and clamped the corners using a napkin chain.	1	0	
10. Adjusting Chair	1	0	
a. Informed patient before adjusting chair.	1	0	
b. Adjusted chair slowly to proper position for the procedure.	1	0	
c. Positioned chair to establish a 12 – 14 inch distance between the patient's face and the operator's face.	1	0	
11. Positioned the operating light over the patient's chest and turned it on.	1	0	
12. Reviewed that all treatment room preparations are organized and set out.	1	0	
13. Washed hands or used alcohol-based hand-rub for hand hygiene.	2	0	
14. Put on personal protective equipment.	2	0	
<i>Judge states, "treatment is completed."</i>	-		
15. Positioned the dental light out of the patient's way.	1	0	
16. Warned the patient not to get out of the chair until it stops moving.	2	0	
17. Used the reset button to lower the chair and return to upright position.	2	0	
18. Removed the protective drape or bib and placed in infectious waste container/biohazard bag.	2	0	

19.	Removed personal protective equipment and disposed of properly.	2	0	
20.	Washed hands or used alcohol-based hand-rub for hand hygiene.	2	0	

<b>Skill III: Seat, Prepare and Dismiss Patient for Periodic Oral Evaluation (con't)</b>		<b>Possible</b>		<b>Awarded</b>
21.	Completed patient records.	2	0	
22.	Provided any postoperative instructions.	2	0	
23.	Cleared path to escort patient and positioned the armrest to release patient.	1	0	
24.	Assisted patient from chair and returned patient's personal items.	1	0	
25.	Escorted patient to business office.	1	0	
26.	Used appropriate verbal and nonverbal communication with patient and other personnel.	2	0	
<b>TOTAL POINTS - SKILL III</b>		<b>46</b>		
<b>70% Mastery for Skill III = 32.2</b>				



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Section # \_\_\_\_\_ Division: \_\_\_\_\_ SS \_\_\_\_\_ PS/C  
 Competitor # \_\_\_\_\_ Judge's Signature \_\_\_\_\_

*\*Competitor will be entering a treatment room that has been cleaned and disinfected.*

<b>Skill IV: Placing &amp; Removing Surface Barriers (Time: 7 minutes)</b>	<b>Possible</b>		<b>Awarded</b>
1. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
2. Selected appropriate surface barriers to be placed over the clean surface.	2	0	
3. Placed each barrier over the entire surface to be protected.	2	0	
4. Checked each barrier is secure and will not come off.  <b><i>Judge states, "procedure is completed." Judge instructs the competitor to remove the barriers.</i></b>	2	0	
5. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
6. Donned PPE and utility gloves.	2	0	
7. Carefully removed each cover without touching underlying surface with utility glove or the contaminated outer surface of the barrier. <b><i>*Judge awards points if disinfection is not required.</i></b>	2	0	
8. Discarded used barriers in regular waste trash (unless scenario indicates consider regulated waste based on state laws).	2	0	
9. Washed, disinfected, and dried utility gloves.	2	0	
10. Properly removed and disposed of all PPE.	2	0	
11. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
<b>TOTAL POINTS - SKILL IV 70% Mastery for Skill IV = 15.4</b>	<b>22</b>		

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Section # \_\_\_\_\_ Division: \_\_\_\_\_ SS \_\_\_\_\_ PS/C  
 Competitor # \_\_\_\_\_ Judge's Signature \_\_\_\_\_  
*Competitors will use tyodont or dentoform for demonstration.*

Skill V: Oral Hygiene Instruction: Brushing and Flossing (Time: 7 mins)	Possible	Awarded
1. Assembled materials and equipment.	1 0	
2. Washed hands or used alcohol based hand-rub for hand hygiene.	2 0	
3. Put on personal protective equipment.	2 0	
4. Greeted patient and introduced self.	2 0	
5. Identified the patient.	2 0	
6. Explained the importance of correctly brushing teeth.	2 0	
7. Suggested use of a soft-textured brush unless dentist recommended alternate.	1 0	
8. Used toothbrush and tooth demonstration model for instruction.		
a. Suggested patient to begin at the facial surface of the right rear teeth and to systematically brush each tooth.	1 0	
b. Placed the brush at a 45° angle to the gumline.	1 0	
c. Rotated the brush slightly and gently pushed bristles between the teeth.	1 0	
d. Used a very short, back-and-forth, light vibrating movements to clean teeth.	1 0	
e. For lingual surfaces, placed the brush in a vertical position.	1 0	
f. Cleaned biting surfaces of all teeth by placing the brush on the surface and using very short, vibrating motions.	1 0	
9. Asked patient if they understand the instruction or have any questions.	2 0	
10. Explained the importance of correctly flossing teeth.	2 0	
11. Flossing using tooth demonstration model.		
a. Removed 12 – 18 inches of floss.	1 0	
b. Wrapped the floss around the middle fingers of both hands to anchor floss.	1 0	
c. As floss is used, unrolled new floss from the middle finger of one hand.	1 0	
d. To clean the maxillary teeth (upper), wrapped the floss around the index finger of one hand and the thumb of the other hand or two thumbs.	1 0	
e. To clean the mandibular teeth (lower), used the index finger of both hands.	1 0	
f. Kept the fingers and thumbs approximately 1-2 inches apart – the length of floss to use.	1 0	
g. Gently inserted the floss between the teeth without snapping floss into the gums.	1 0	
h. Gently slid the floss into the space between tooth and gum, stopping when resistance is felt.	1 0	
i. Curved the floss into a C shape around the side of the tooth	1 0	
j. Held the floss tightly against the tooth and moved away from gum up and down on the side of the tooth.	1 0	



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<b>Skill VI: Preparation, Manipulation, Delivery, &amp; Handling of Alginate Impressions (7 minutes)</b>		<b>Possible</b>		<b>Awarded</b>
1.	Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
2.	Donned gown, surgical mask, protective eyewear, and gloves.	2	0	
3.	Assembled materials.	1	0	
4.	Verbalized appropriate measures for each type of impression.	1	0	
	a. Mandibular – 2 measures room temperature water and 2 scoops alginate.			
	b. Maxillary – 3 measures room temperature water and 3 scoops alginate.	1	0	
5.	Measured water for identified impression (scenario).	1	0	
6.	Placed water in the flexible mixing bowl.	1	0	
7.	Fluffed the powder prior to opening the powder canister by turning the can end-over-end a few times.	1	0	
8.	Carefully lifted the lid to prevent particles from flying in the air.	1	0	
9.	Filled the measuring device with powder for identified impression (scenario).	1	0	
10.	Used spatula to mix the powder into the water making sure all powder has been moistened.	1	0	
11.	Firmly spread the alginate between the spatula and the side of the rubber bowl.	1	0	
12.	Mixed with spatula until the mixture appears creamy and smooth.	1	0	
13.	Wiped the alginate mixture into one mass on the inside edge of the bowl.	1	0	
14.	Loaded mixture into impression trays – mandibular tray loaded from both lingual sides and maxillary filled from the posterior part of the tray.	1	0	
15.	Used the flat side of the blade to condense the material firmly into the tray.	1	0	
16.	Smoothed impression material with a wet finger.	1	0	
<b>*Judge will simulate or take impression on typodont, and pass impression back to competitor.</b>				
17.	Rinsed impression gently under tap water to remove any debris for at least 30 seconds.	1	0	
18.	Sprayed impression with disinfectant.	2	0	
19.	Wrapped impression in airtight container or a moist paper towel.	1	0	
20.	Placed impression into plastic bag and labeled with patient's name.	1	0	
21.	Disposed of any remaining alginate in trash container.	2	0	

22. Cleaned bowl and placed for disinfecting.	2	0	
<b>Skill VI: Preparation, Manipulation, Delivery, &amp; Handling of Alginate Impressions (con't)</b>	<b>Possible</b>		<b>Awarded</b>
23. Removed and disposed of PPE.	2	0	
24. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
<b>TOTAL POINTS - SKILL VI</b> <b>70% Mastery for Skill VI = 22.4</b>	<b>32</b>		

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 Competitor # \_\_\_\_\_ Judge's Signature \_\_\_\_\_

*\*Competitor will be entering sterilization center for Skill VII. All items will be submersible.*

<b>Skill VII: Operating the Ultrasonic Cleaner (Time: 5 minutes)</b>	<b>Possible</b>	<b>Awarded</b>
1. Put on gown, mask, eyewear, and utility gloves.	2	0
2. Removed the lid from the container of the ultrasonic device.	1	0
3. Determined that the ultrasonic device is filled to the point recommended by manufacturer.	2	0
4. Placed loose instruments in the basket, or if using cassettes placed the cassettes in the basket.	1	0
5. Replaced the lid.	1	0
6. Turned the ultrasonic device to "on"	1	0
7. Verbalized that device will run from 5 to 15 minutes depending on the ultrasonic unit. <b>Judge will state, "cleaning is completed".</b>	1	0
8. Removed the basket and thoroughly rinsed the instruments in a sink under running tap water keeping splashing to a minimum.	1	0
9. Held the basket at an angle to allow water to run off.	1	0
10. Gently turned the basket on a towel and removed instruments.	1	0
11. Replaced lid on the ultrasonic device.	2	0
12. Placed all sanitized instruments into area designated for disinfection and sterilization.	2	0
13. Cleaned and disinfected in the work area.	2	0
14. Cleaned utility gloves.		
a. Washed with soap and water under faucet.	2	0
b. Removed and disinfected utility gloves with surface disinfectant wipes.	2	0
15. Removed PPE and discarded in regular trash container.	2	0
16. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0
<b>TOTAL POINTS - SKILL VII</b> <b>70% Mastery for Skill VII = 18.2</b>	<b>26</b>	

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<b>Skill VIII: Personal Protective Equipment (PPE): Donning and Doffing (Time: 5 minutes)</b>	<b>Possible</b>	<b>Awarded</b>
1. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0
2. Gown:		
a. Fully covered torso from neck to knees, arms to end of wrists, and wrapped around back.	2	0
b. Fastened in back of neck and waist.	2	0
3. Mask		
a. Secured ties or elastic bands at middle of head and neck or around ears.	2	0
b. Fitted flexible band to the bridge of the nose.	2	0
c. Fitted snug to the face and below chin.	2	0
4. Facewear		
a. Placed over the face and eyes.	2	0
b. Adjusted over mask.	2	0
5. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0
6. Donning gloves:		
a. Gloved hands.	2	0
b. Made sure the gloves extend over the cuff of the gown. <b>Judge states, "skill is completed".</b>	2	0
7. Removing gloves:		
a. Using gloved hand, grasped palm area of other gloved hand and peeled off first glove.	2	0
b. Held the removed glove in the gloved hand.	2	0
c. Slid the fingers of ungloved hand under remaining glove at the wrist.	2	0
d. Pulled downward to remove glove, turning inside out.	2	0
e. Disposed of glove in waste container.	2	0
8. Removing eyewear:		
a. Removed from the back touching only the ear rests.	2	0
b. Placed the eyewear on disposable towel until can be cleaned and disinfected.	2	0
8. Removing mask:		
a. Slid fingers under the elastic strap in front of ears or untied to remove.	2	0
b. Discarded make in waste receptacle.	2	0
9. Removing gown:		
a. Unfastened gown ties without allowing sleeves to contact body.	2	0
b. Pulled gown away from neck and shoulders touching the inside of the gown only.	2	0
c. Turned gown inside out, and folded into bundle.	2	0
<b>Skill VIII: Donning and Doffing PPE (con't)</b>	<b>Possible</b>	<b>Awarded</b>

d. Discarded gown in waste container.	2	0	
10. Washed hands or used alcohol based hand-rub for hand hygiene.	2	0	
<b>TOTAL POINTS - SKILL VIII</b> <b>70% Mastery for Skill VII = 35</b>		<b>50</b>	