

Clinical Lab for Animal Health

- Purpose** Provide HOSA members with an opportunity to develop and demonstrate knowledge and skills in veterinary care.
- Description** This event is offered only in Ohio at the Region and State levels. The event consists of a written multiple choice knowledge test at the Regional level. The event at the State level consists of two rounds – Round One is a written knowledge test and Round Two consists of a skills event. The written test will measure knowledge and understanding at the recall, application or analysis levels. Higher-order thinking skills will be incorporated as appropriate. Based on the state level pre-registration numbers, Round Two will be optional. The top scoring competitors at the state level may advance to Round Two for the performance of selected skill(s) identified in a written scenario. The scenario will require the use of critical thinking skills. The performance will be timed and evaluated according to the event guidelines.
- Dress Code** Competitors shall wear proper business attire or official HOSA uniform, or attire appropriate to the occupational area, during the orientation, written test and skill(s)– jeans and shorts are not acceptable. Bonus points will be awarded for [proper dress](#).
- Rules and Procedures**
- Competitors in this event must be active members of HOSA-Future Health Professionals, in good standing in the division in which they are registered to compete (Secondary).
 - Competitors must be familiar with and adhere to the "[General Rules and Regulations of the HOSA Competitive Events Program](#) (GRR)."
 - The written test will consist of fifty (50) multiple choice items. The test score will be used as part of the final score.

Round One: Written Test

Hematology and Hemostasis	25%
Clinical Chemistry and Serology	25%
Microbiology, Cytology, and Urinalysis	25%
Parasitology	25%

- All competitors shall report to the site of the Round One test.
- [Test Instructions](#): There will be a maximum of **60 minutes** to complete the test. There will be a verbal announcement when there are 15 minutes remaining.
- All official references are used in the development of the written test.
 - [Sirois, Margi. Principles and Practice of Veterinary Technology. Elsevier Mosby. Latest edition. Chapters 7,8,9,10](#)

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7. The test score from Round One will be used to qualify the competitor for the Round Two skills. The skills approved for Round Two for this event are:

Skill I: Prepare and process a hematocrit including total protein
Skill II: Intestinal Parasite Exam by Centrifugation
Skill III: Preparation of a blood smear including staining
Skill IV: Calibrating and obtaining urine specific gravity
Skill V: Prepare and gram stain an ear smear

(FOR ALL SKILLS, BODY FLUIDS WILL BE A SIMULATED PRODUCT)

8. HOSA Management and event personnel have the option of providing one additional minute to the skill event interval prior to the scenario for competitors to preview the equipment that is provided for the event. If given, the one minute allowed for equipment preview will be added to the overall skill interval and competitors will be told they have an extra minute to review the equipment.
9. The selected skill(s) for Round Two, in the form of a written scenario, will be presented to the competitor at the start of the skill to be performed. One or more skills may be combined in the scenario. The scenario will be the same for each competitor and will include a challenging component that will require the competitor to apply critical thinking skills. A sample scenario can be found [here](#).
10. The scenario is a secret topic. Professional ethics demand that competitors DO NOT discuss or reveal the secret topic for ANY event until after the event has concluded. Violation of the ethics rules will be severely penalized.
11. In case of a tie, the highest test score will be used to determine the rank.
12. Competitors must complete all steps of the skill listed in the guidelines even if the steps must be simulated/verbalized. Steps may NOT be simulated/verbalized when the equipment/materials are available.
13. The timing for the skill will begin when the scenario is presented. Competitors will be stopped at the end of the time allowed for selected skill(s).

Competitor Must Provide:

- Two #2 lead pencils with eraser
- Watch with second hand (optional)
- Sterile non-latex surgical gloves
- Exam non-latex gloves

Required Personnel:

- One judge per skill per section
- Proctor for Testing

Facilities, Equipment and Materials:

Round One: Written Test (Reference: All resources)

- List of competitors for check-in
- One pre-numbered test per competitor
- Scantron/answer forms- one copy per competitor
- #2 lead pencils with eraser to complete evaluations (event personnel)

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Round Two Skills: General

- Clinical and/or laboratory stations for selected skills
- List of competitors for check-in
- Written Scenario - copies for judges, section leaders
- Judge scripts as needed
- #2 lead pencils (judges & evaluations)
- Rating sheets - one per judge per competitor
- Evaluation forms - competitor, judge, event personnel
- Copy of guidelines for judges

Skill I Prepare and process a hematocrit including total protein

- 2 capillary tubes
- Clay sealant
- Blood sample
- Micro hematocrit reader
- Kem-wipes
- Centrifuge
- 2 capillary tubes that have been spun
- Refractometer
- Written scenario that indicates the patient's identity and surgical skill being performed

Skill II Intestinal Parasite Exam by Centrifugation

- Feces
- 15-ml conical test tubes
- 2 paper cups
- Strainer
- Coverslip
- Microscope slide
- 2 applicator sticks
- Test tube rack
- Fecal floatation solution
- Timer
- Swing-arm centrifuge
- Lead pencil

Skill III Preparation of a blood smear including staining

- 2 clean, unchipped microscope slides
- A lead pencil for writing on the thick end of the smear
- Patient's file
- Blood sample
- Pipette
- Exam gloves
- Blood smear – completely dried
- Diff-Quick or comparable stain in Coplin jars
- Paper towels
- Waster wash bottle
- Plastic clothes pins

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Skill IV Calibrating and obtaining urine specific gravity)

- Distilled Water
- Refractometer
- Calibration tool
- Urine sample
- Refractometer

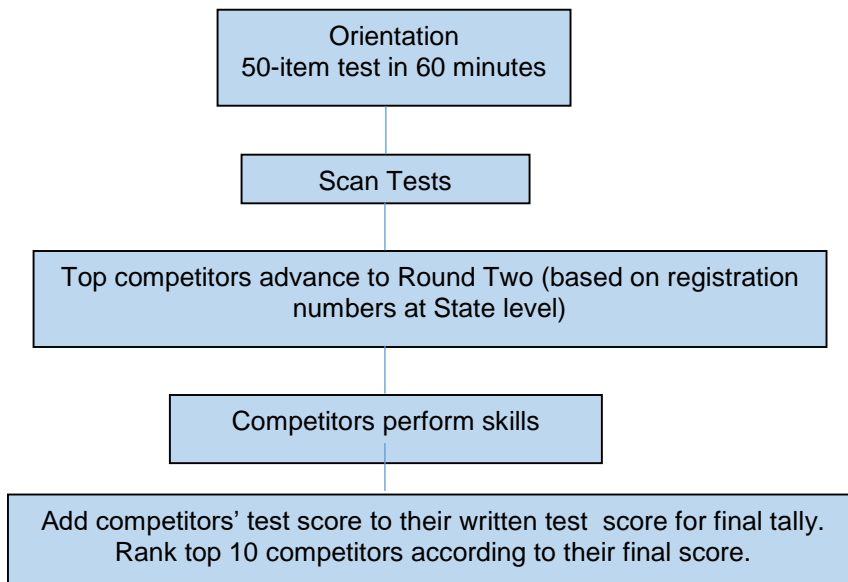
Skill V Prepare and gram stain an ear smear

- Applicator sticks with “ear wax”
- Clean slides
- Wax pencil to label slides
- Slide with ear materials
- Flame source (Bunsen burner, lighter) or heat source
- Lead pencil
- Gram stain in Coplin jars
- Plastic clothes pin or forceps

Sample Round One Test Questions

1. The average gestational period for a cat is:
 - A. 15-20 days.
 - B. 30-35 days.
 - C. 58-65 days.
 - D. 90-112 days.

Event Flow Chart



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Competitor Name: _____

Judge's Signature: _____

Skill I Prepare and process a hematocrit including total protein (Time: 7 minutes)	Possible	Awarded
1. Fill both capillary tubes to 2/3 to ¾ full with blood. Both tubes should be close to equal amounts.	2 1 0	
2. Wipe tubes with kem-wipes	2 0	
3. Push the end of the tubes into the clay sealant	1 0	
4. Balance the centrifuge by place in the tubes with the sealant facing outwards, and the tubes across from each other	2 0	
5. Close lid of centrifuge and secure tightly.	1 0	
6. Run according to the manufacturer's directions for time and speed.	2 0	
7. After the centrifuge has stopped completely, remove the tubes of blood.	2 0	
8. Place the tube on the micro hematocrit reader to read the PCV %.	2 0	
9. Record in patient record.	2 0	
10. Clean up and disinfect work area.	1 0	
11. Put materials away.	1 0	
12. Dispose of blood in a biohazard waste container.	1 0	
13. Break capillary tubes between the Buffy coat and the plasma.	2 0	
14. Completely cover the prism surface with plasma.	1 0	
15. Lower the cover plate.	1 0	
16. Hold the refractometer to the light, focus, and take the reading.	1 0	
17. Record the results in gram per deciliter in the patient's record	1 0	
18. Clean the refractometer and place it in the case	1 0	
19. Clean the area.	1 0	
20. Place the blood tubes and any blood-contaminated items in the hazardous waste container.	1 0	
TOTAL POINTS -- SKILL I	28	

***If a student jeopardizes his/her own safety and does not take immediate action to correct the error, the total points for the skill or specific subpart(s) of the skill will be deducted.*

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CLINICAL LAB FOR ANIMAL HEALTH

Competitor Name: _____ Judge's Signature: _____

Skill II Intestinal Parasite Exam by Centrifugation (Time: 4 minutes)	Possible	Awarded
1. Put on PPE.	1	0
2. Use applicator sticks to remove a gram of feces (about the size of a dime) from the sample and place in one of the paper cups.	1	0
3. Add 15mL of fecal solution; mix well with the applicator stick.	1	0
4. Place the strainer over the second cup and pour the fecal mixture into the strainer.	2	0
5. Place a bend in the rim of the second cup to fill the test tube with the sample.	2	0
6. Place the partially filled test tube into the centrifuge.	2	0
7. Add enough fecal flotation solution in in the tube to make a positive meniscus.	1	0
8. Gently place a coverslip onto the top of the fluid.	2	0
9. Balance the centrifuge with a test tube filled with water and cover slipped directly opposite the test sample.	2	0
10. Spin for 3-5 minutes at 1300-1500 rpm.	2	0
11. After the centrifuge has come to a complete stop, carefully remove the coverslip and place it on the labeled microscope slide.	2	0
12. Clean up work area with disinfectant.	2	0
TOTAL POINTS -- SKILL II	20	

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Competitor Name: _____ Judge's Signature: _____

Skill III Preparation of a blood smear including staining (Time: 5 minutes)	Possible		Awarded
1. Mix the blood thoroughly then quickly take off the cap, and using a pipette, aspirate a small amount of blood and place a small drop on the end of one of the slides.	1	0	
2. Maintain continuous pressure on the second slide during the spreading process. If done properly, the blood smear will have a thumb-shaped feathered edge at the end opposite the drop of blood. The remaining blood from the drop will form a half-circle adjacent to the beginning of the smear.	1	0	
3. Switch slides and make a second smear.	1	0	
4. A good slide will have a 'feathered edge' that looks like a rainbow when held up to the light.	2	0	
5. Place the slides aside to dry.	2	0	
6. After the slide is dry, use the lead pencil to label it with the patient's ID on the thick end of the slide.	2	0	
7. Set out the stains in the order they will be used, with the lids off and directly behind the jars.	2	0	
8. Grasp the thick end of the slide with the clothes pin.	2	0	
9. Lower the slide into the fixative so it is immersed completely for 1 second, repeat 9 times.	2	0	
10. Lift the slide up, tilting to drain excess fixative back into the jar for just a second or so.	1	0	
11. Lower the slide into the eosin stain so it is immersed completely for 1 second, repeat 6 times.	2	0	
12. Lift the slide up, tilting to drain excess stain back into the jar for just a second or so.	1	0	
13. Lower the slide into the methylene blue stain so it is immersed completely for 1 second, repeat 4 times.	1	0	
14. Lift the slide up, tilting to drain excess stain back into the jar for just a second or so.	1	0	
15. Rinse the slide with the distilled water wash bottle until the water	1	0	

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washes clear.			
16. Place the slide upright on a paper towel and leaned against another object.	1	0	
17. Allow the slide to air-dry completely.	1	0	
18. Put lids back on Coplin jars	1	0	
19. Put any blood materials in the biohazard container.	1	0	
20. Clean the work area.	1	0	
TOTAL POINTS – SKILL III		27	

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Competitor #: _____ Judge's Signature: _____

Skill IV Calibrating and obtaining urine specific gravity (Time: 3 minutes)	Possible	Awarded
1. Completely cover the prism surface with distilled water.	1	0
2. Lower the cover plate.	1	0
3. Hold the refractometer to the light, focus, and take the reading.	2	0
4. If reading is 0.000, then state the refractometer is calibrated and clean refractometer.	2	0
5. If reading is greater than 0.000, use calibration tool to calibrate refractometer to 0.000.	1	0
6. Clean refractometer.	2	0
7. Gently mix the urine sample.	2	0
8. Completely cover the prism surface with urine.	2	0
9. Lower the cover plate.	2	0
10. Hold the refractometer to the light, focus, and take the reading.	1	0
11. Record the result in the patient's record.	1	0
12. Clean the refractometer and place it in the case.	1	0
13. Clean the area.	1	0
14. Place the urine container and any urine-contaminated items in the hazardous waste container.	1	0
TOTAL POINTS – SKILL IV	20	

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CLINICAL LAB FOR ANIMAL HEALTH

Competitor #: _____ Judge's Signature: _____

Skill V Prepare and gram stain an ear smear (Time: 6 minutes)	Possible	Awarded
1. Use cotton applicator to roll ear material onto slide in three non-overlapping rows.	3 2 1 0	
2. Dispose of applicator sticks in biohazard container.	1 0	
3. Label slide with patient ID and indicate if AD or AS.	1 0	
4. Slide is fixed by passing over the flame or heat source briefly.	1 0	
5. Clothes pin or forceps are attached on the frosted end of the slide.	2 0	
6. Place slide into crystal violet stain for 30 seconds. Drain slide on edge of jar before removing.	2 0	
7. Rinse with distilled water.	1 0	
8. Place slide in iodine solution for 30 seconds. Drain slide on edge of jar before removing.	2 0	
9. Rinse with distilled water.	1 0	
10. Place slide in 95% ethanol for 10 seconds. Drain slide on edge of jar before removing.	2 0	
11. Rinse with distilled water.	1 0	
12. Place slide in Safranin counterstain for 30 seconds. Drain slide on edge of jar before removing.	2 0	
13. Rinse with distilled water.	1 0	
14. Place slide upright on paper towel to dry (or rack).	2 0	
15. Clean up work area.	2 0	
TOTAL POINTS -- SKILL V	24	

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