



PARASITOLOGY ROCKS!

HOW TO CREATE A PARASITOLOGY ESCAPE ROOM FOR FUN AND
ENGAGEMENT

Stacey Benton DVM

University of Cincinnati Blue Ash College Veterinary Technology Program

PLAN FOR TODAY...



- Creating the activity
- Complete the escape room together
- Share a virtual version
- But first...



START YOUR PROJECT

- Add 1 bag of oyster crackers to the baggie
- Add water to almost float crackers
- Seal bag and set aside for now

SETTING THE STAGE

- Lab Procedures is a three-course series
 - LP I (summer): hematology and clinical chemistry
 - LP II (fall): urinalysis and parasitology
 - LP III (spring): exotic hematology and cytology
- Use clinical case studies to review and tie-together bloodwork, UA and cytology
- Parasitology never fit in well with case studies
 - Used the escape room as a review spring semester

GETTING STARTED

- Need a story
 - I wanted to focus on common small animal parasites, so chose a new kitten visit as the storyline
 - Each station tells part of the story, then asks a question
- Keep it simple
 - I envisioned an elaborate set up with pulleys and reveals, but that wasn't necessary to be fun or effective
 - Entire activity set up within a small storage room
- Expect it to take longer than you think
 - Students were stressed by the time component



INTRODUCTION TO THE ACTIVITY

Students are given a blank answer sheet with the following introduction:

Your next appointment today is a new patient, an 8-week-old, female Kitten named Sassy. You can't wait! You show Sassy and her owner, Ms. Felyne, into the exam room and get Sassy out of the carrier. Uh oh! Sassy is not very sassy. She's quiet, her coat is rough and a bit unkempt, and she's quite thin.

INTRODUCTION TO THE ACTIVITY

As always, you start asking the owner history questions. Unfortunately, Ms. Felyne just found Sassy yesterday outside her place of work. It was cold outside, and she was worried Sassy wouldn't survive out there on her own. All she can tell you is that Sassy's appetite seems ok, and she's eating canned kitten food. This is Ms. Felyne's first pet, so she's not really sure how much to feed a kitten. Sassy did use the litterbox, but Ms. Felyne forgot to bring in a fecal sample as directed.

INTRODUCTION TO THE ACTIVITY

You TPR Sassy with the following results: T 101.0°, P 180, R 30. Her mucous membranes are pale pink, slightly tacky, and the CRT is <2 seconds.

Your brain is already turning over the many possible diagnoses. After a brief consult with the vet, who's running behind, you prepare an estimate for the owner and request she leave Sassy with you for a few hours. She agrees, and you collect your samples from Sassy.

STATION 1

You collect blood for baseline bloodwork. The CBC and chemistry results are shown here. Thankfully, the FeLV and FIV tests are negative.

Review the results first, then answer the questions.

Patient: Felyne, Sassy	UCBA Vet Tech	Accession: 000
Species: 1500Feline	Cincinnati, OH 45236	Veterinarian: Benton, Stacey
Breed: Domestic Short Hair		Patient MRN:
Age: 2 m		Received Date: 2/2/2023 5:21 AM
Gender: Female		Reported Date: 2/2/2023 7:19 AM

Test Requested: Basic CBC, Canine/Feline (healthy, non-geriatric), ClinChem 25, Canine/Feline

Test Name	Result	Units	Flag	Reference Range/Cutoff
ClinChem 25, Canine/Feline				
Tube type submitted: Serum Separator (with gel) - Spun				
Glucose	73	mg/dL		63 - 148
Creatinine	1.5	mg/dL		0.6 - 2.2
BUN	28	mg/dL		15 - 40
BUN:Creatinine Ratio	19	Ratio		9 - 38
Phosphorus	5.6	mg/dL		2.7 - 7.6
Calcium	9.7	mg/dL		8.9 - 10.6
Magnesium	2.4	mg/dL		1.8 - 3.3
Sodium	153	mEq/L		146 - 156
Potassium	4.4	mEq/L		3.7 - 5.4
Sodium:Potassium Ratio	35	Ratio		28 - 41
Chloride	115	mEq/L		113 - 124
CO2	17	mEq/L		15 - 24
Anion Gap	25	mEq/L		11 - 25
Osmolality (Calc)	329	mOsm/kg		314 - 335
Total Protein	7.8	g/dL		5.9 - 8.2
Albumin	2.9	g/dL		2.7 - 3.9
Globulins	4.5	g/dL		2.8 - 4.9
Albumin:Globulin Ratio	0.64	Ratio		0.6 - 1.3
ALT	46	U/L		26 - 143
AST	28	U/L		14 - 54
Alk Phos	25	U/L		12 - 65
GGT	2.5	U/L		<3
Bilirubin-Total	0.1	mg/dL		0.0 - 0.3
Cholesterol	107	mg/dL		70 - 340
Creatine Kinase (CK)	123	U/L		74 - 371

Test Name	Result	Units	Flag	Reference Range/Cutoff
Basic CBC, Canine/Feline (healthy, non-geriatric)				
WBC	14.6	K/uL		3.8 - 16.8
RBC	5.7	M/ul	LOW	5.9 - 11.5
Hemoglobin (HGB)	7.8	g/dL	LOW	8 - 16
Hematocrit (HCT)	27	%	LOW	30 - 50
MCV	54	fL	HIGH	38 - 53
MCHC	35	g/dL		32 - 36
CHCM	32	g/dL		31 - 37
Retics	16	K/uL	HIGH	< 15
% Neutrophil	86.0	%		
% Lymphocyte	8.1	%		
% Monocyte	2.7	%		
% Eosinophil	3.2	%		
Neutrophils	11425	/uL	HIGH	1900 - 9500
Lymphocytes	1179	/uL		408 - 6300
Monocytes	393	/uL		0 - 604
Eosinophils	1603	/uL	HIGH	0 - 1520
PLATELETS	378	K/uL		165 - 494
MPV	16.3	fL		9.5 - 27.4

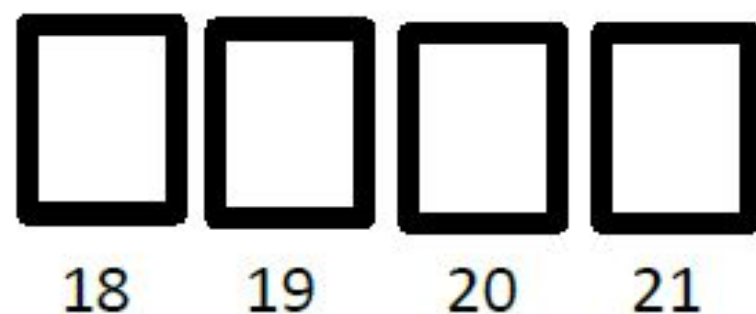
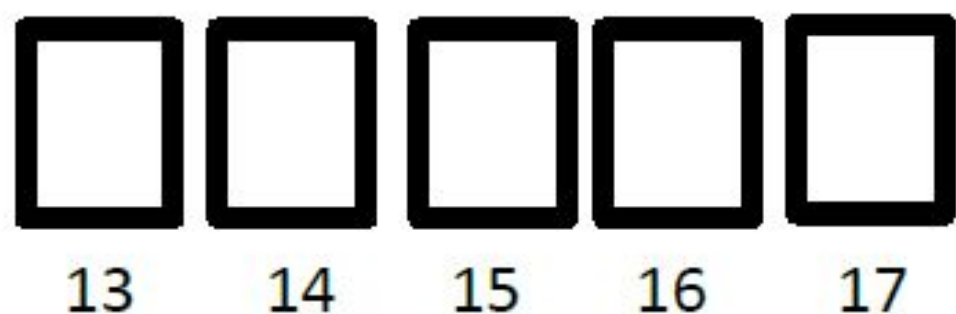
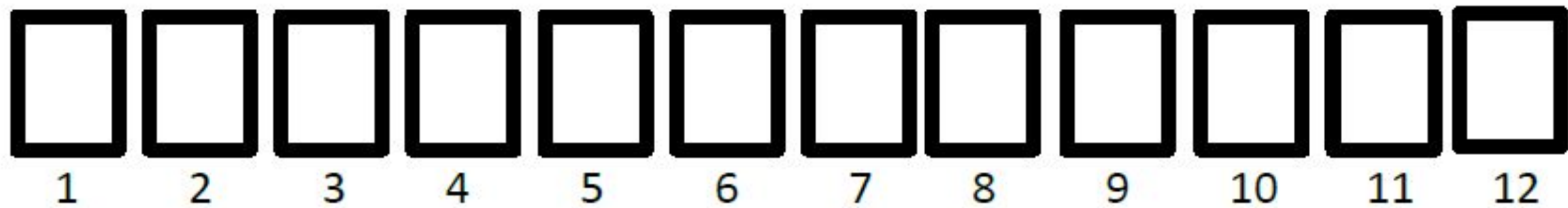
STATION 1

Sassy is anemic. You remember learning that anemias are classified by RBC color and size and by bone marrow response. This is important to recognize because different classifications indicate different underlying causes.

How do you classify the anemia based on bone marrow response?

What is the general cause of this type of anemia?

Station 1



How do you classify the anemia based on bone marrow response?

R **E** **G** **E** **N** **E** **R** **A** **T** **I** **V** **E**
1 2 3 4 5 6 7 8 9 10 11 12

What is a common cause of this type of anemia?

B **L** **O** **O** **D** **L** **O** **S** **S**
13 14 15 16 17 18 19 20 21

STATION 2

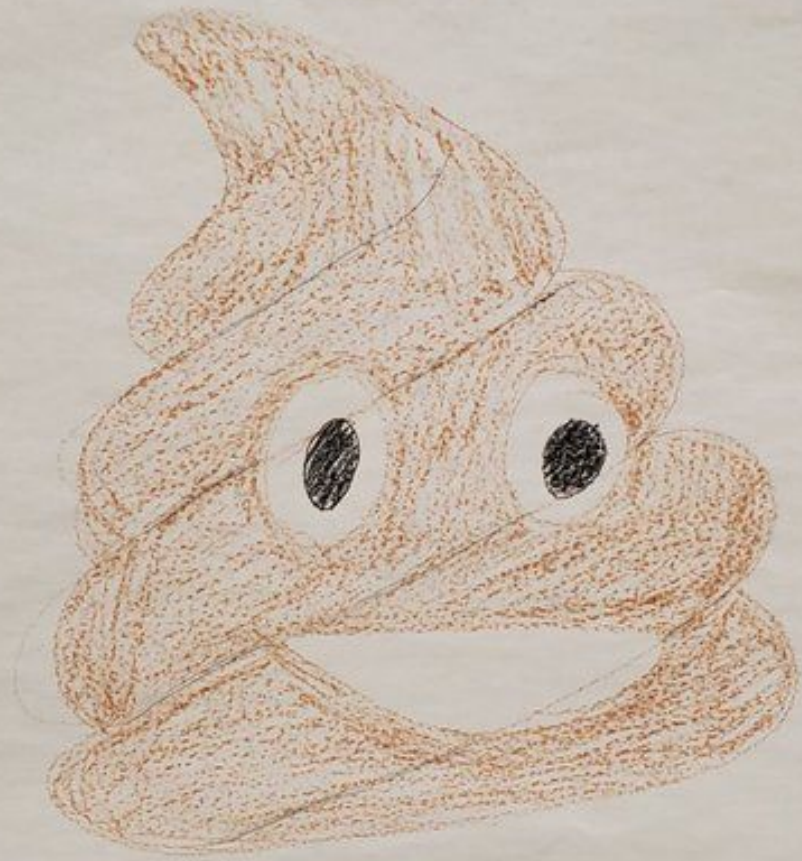


*Time to run the fecal!
Collect your sample
to reveal the next
question.*

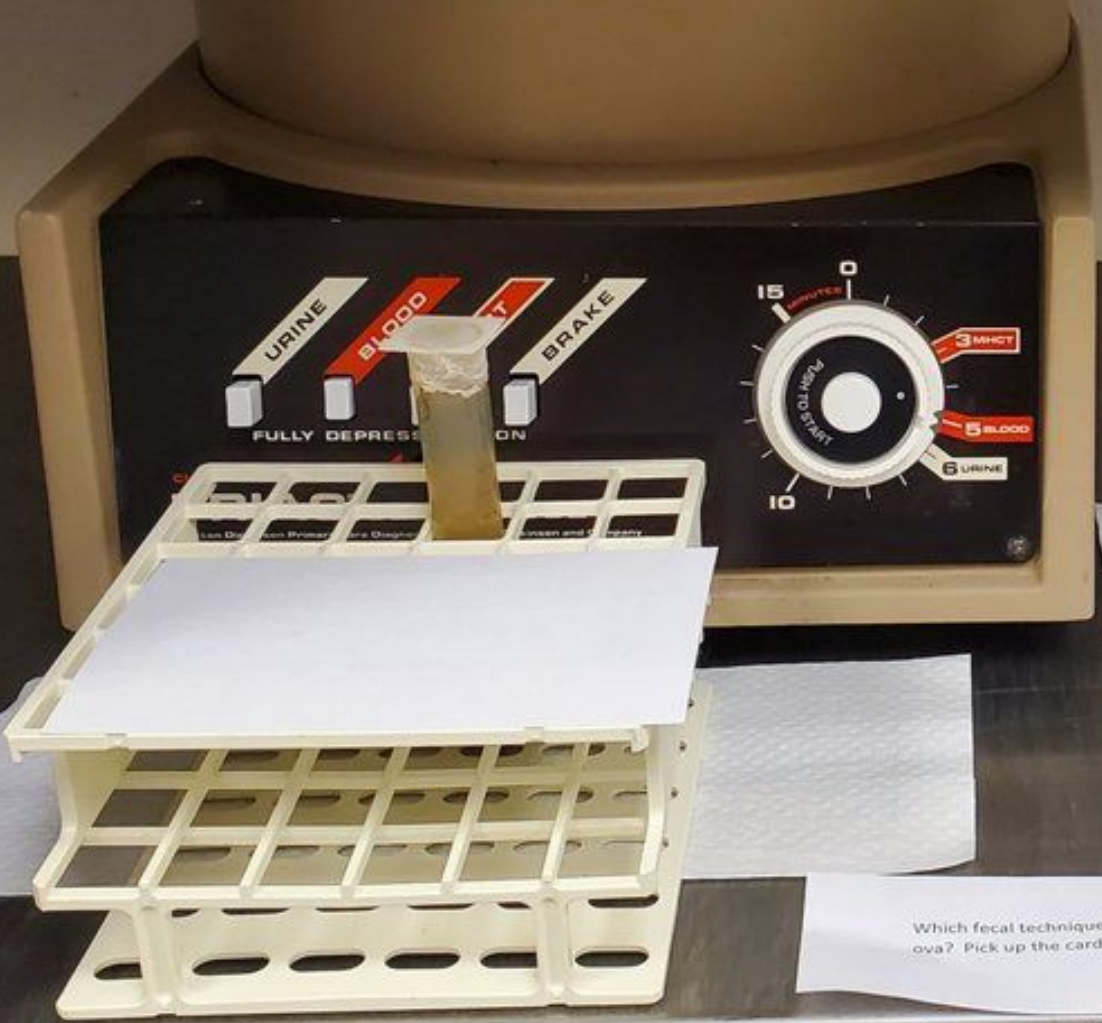
Proceed to the station marked







CAUTION
Possible Casualty Hazard.
Balance Load Before Operating
Any Centrifuge.



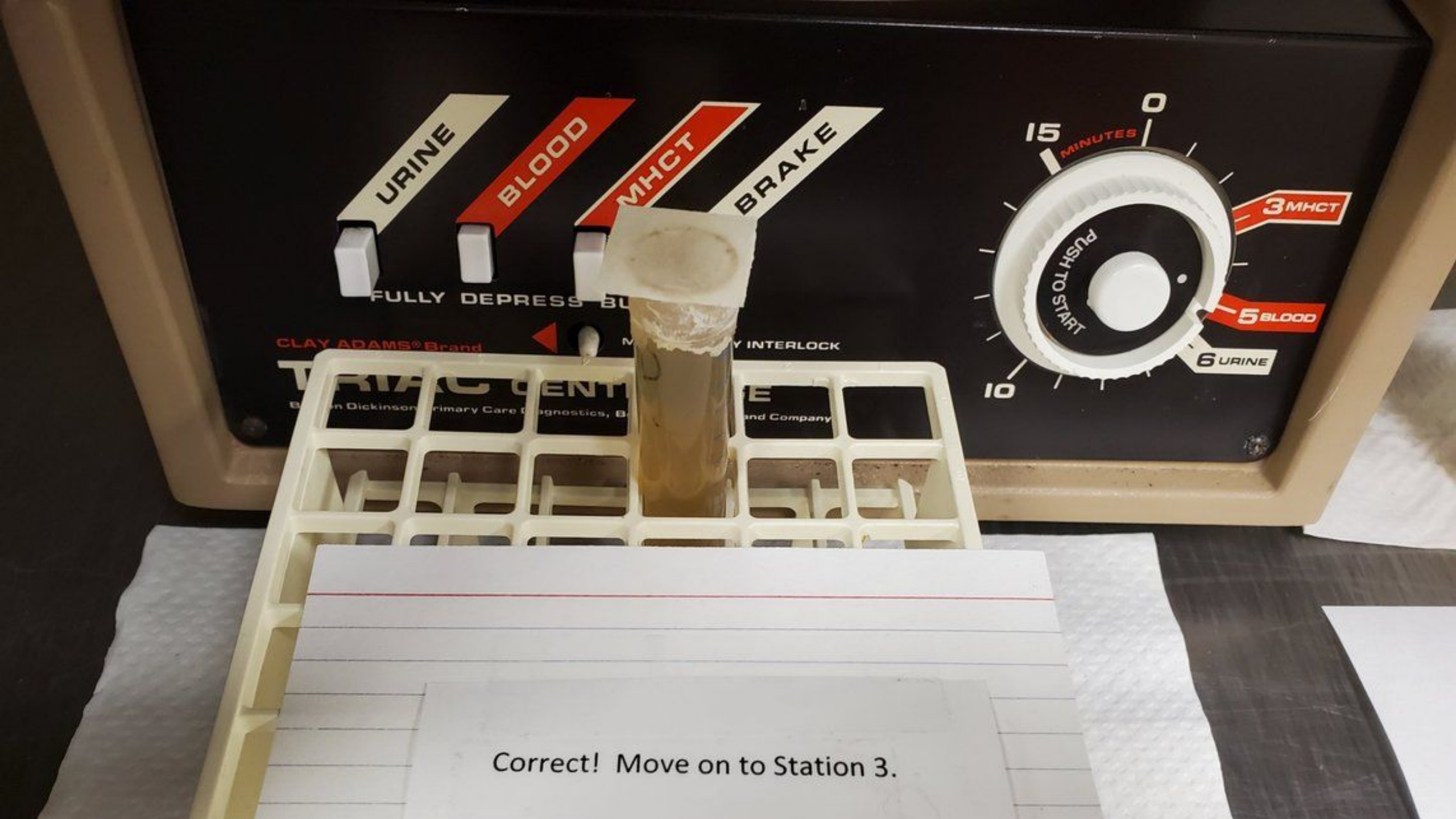
Which fecal technique is considered the most sensitive test to detect parasitic ova? Pick up the card to see if you're right!

STATION



Which fecal technique is considered the most sensitive test to detect parasitic ova? Pick up the card to see if you're right!

- Centrifugation
- Passive floatation
- Direct smear



URINE

BLOOD

MHCT

BRAKE

FULLY DEPRESS BU

CLAY ADAMS® Brand

INTERLOCK

TRIAC CENTRIFUGE
B... Dickinson Primary Care Diagnostics, B...
... and Company

15 MINUTES
0
10
PUSH TO START
3 MHCT
5 BLOOD
6 URINE

Correct! Move on to Station 3.

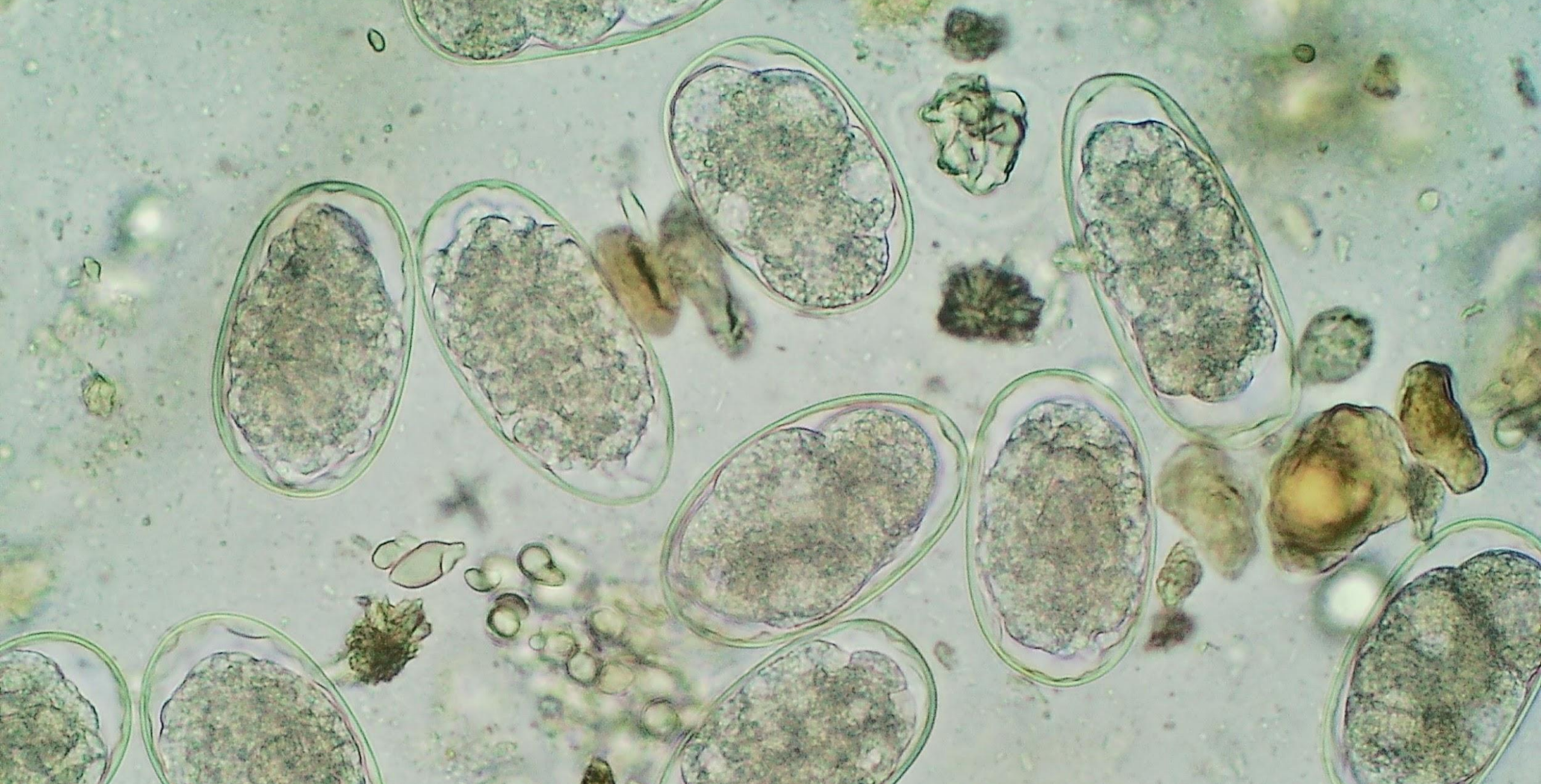


Incorrect. You must wait one minute before

Incorrect. You must wait one minute before you can move on to Station 3.

STATION 3

Time to read the fecal slide. Ah ha! The anemia makes perfect sense. Identify the parasite on the microscope by genus.



ANCYLOSTOMA

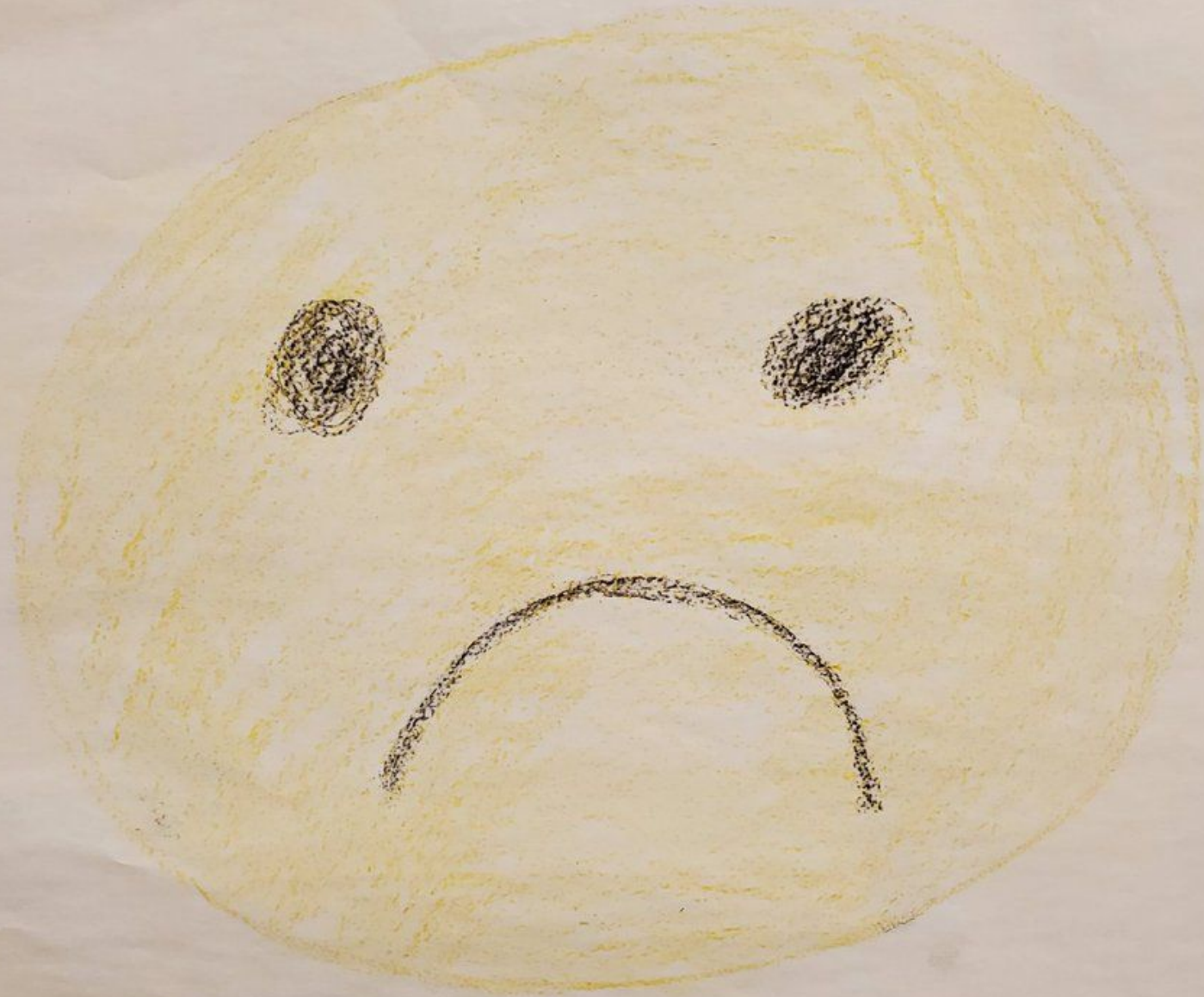


STATION 4

*Poor Sassy. She looks miserable in the cage.
Pick her up to reveal the next question.*



Proceed to the station marked ☹️



STATION



Uh oh! Sassy must be stressed. That's why she vomited on the table. Wait! What do you see in the vomit? It's another parasite! Identify the adult in the vomit by its full scientific name (just play along with me, ok).



TOXOCARA CATI



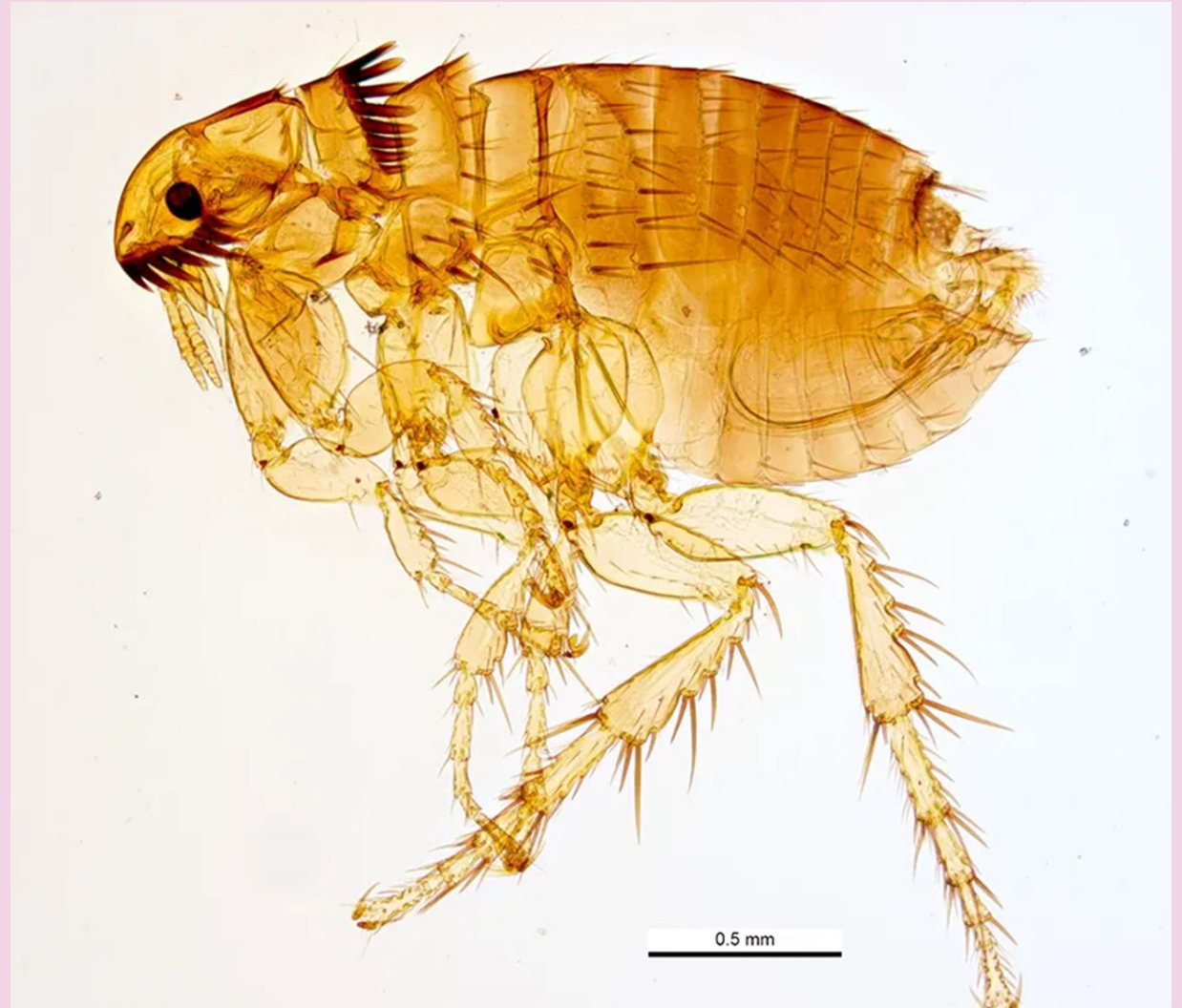
FINISH YOUR OWN FAKE VOMIT

- Add a spoonful or two of canned cat food to the baggie with oyster crackers
- Mash it around and add more water if needed to achieve desired consistency
- Add a few pieces of spaghetti that have been soaked overnight in water
- Voila!

STATION 5

As you comfort Sassy, you start to feel a little itchy. Ouch! Something just bit you. Looking carefully through Sassy's fur, you find something and put it on the microscope to verify. Identify the parasite on the microscope by genus.

CTENOCEPHALIDES



STATION 6

With your superb nursing care and appropriate treatment, Sassy makes a full recovery. Now it's time to send her home with preventative care.

Proceed to the station marked 😊.



Flanco

...in, microencapsulated and immediate release...
 ...at least 2.2 lbs (1 kg).
 ...The effectiveness of this product when used before bathing has not been evaluated.
 ...Use with caution in sick or debilitated cats. One injection or exposure should be repeated.
 ...and antibody negative prior to entering the kennel. In a laboratory study, cats artificially infected with adult heartworms and treated with PROFENDER Topical Solution had fewer worms recovered...

profender

(emodepside/proziquantel)

Topical Solution
 For Cats and Kittens
 8 weeks of age and older
 and weighing at least 2.2-5.5 lbs
 Contains 20 - 0.25 ml tubes
 Each tube contains 7.5 mg of emodepside and 30 mg of proziquantel.



...be on the skin...
 ...infections caused by *Ancylostoma*...
 ...infections caused by *Diipyldium caninum* (adults)...
 ...infections caused by *Diipyldium caninum* (adults)...
ANIMAL SAFETY:
 In a field study, PROFENDER Topical Solution was used in cats receiving other...
 ...products including: analgesics, anti-fungals, non-steroidal anti-inflammatories, anthelmintics,
 ...antimicrobials, flea and tick products, sedatives, anesthetics, cardiac medications, anxiolytics,
 ...hormonal treatments, steroids, otc and ophthalmic preparations, and vaccines.

READ THE ENTIRE LABEL
 For the prevention and treatment of flea infestations on your cat and for the control of flea life stages.
 Kills flea on cat's body shortly after application.
 Kills flea on cat's body shortly after application.
 Kills flea on cat's body shortly after application.



advantage II kitten

Once-a-Month Topical Flea Prevention and Treatment for Cats
 For Use ONLY on Cats 8 Weeks and Older
 For Use ONLY on Cats Weighing Under 6 lbs.

- Kills all flea life stages
- Controls existing flea infestations on your cat and prevents further infestations
- Kills fleas within 12 hours of application

Active Ingredients: Imidacloprid, Pyriproxyfen
 Inactive Ingredients: Ethanol, Propylene Glycol, Water

KEEP OUT OF REACH OF CHILDREN CAUTION

For consumer questions call 1-800-441-4441
 For medical emergencies call 1-800-441-4441
 It is a violation of Federal Law to use this product if:
 - Do not apply more than one (1) tube.
 - Do not have contact or allow contact with children to apply.
HOW TO OPEN:
 1. Do not tear tube at bottom of pouch.
 2. Using scissors, cut the pouch.
HOW TO APPLY:
 1. Advantage II Kitten: Use only on cats or kittens weighing less than 6 lbs. Do not apply to cats or kittens weighing more than 6 lbs. Do not apply to cats or kittens weighing less than 6 lbs. Do not use on other animals.
 2. Cats should be dry prior to application.
 3. Remove one pouch from the carton. See "HOW TO OPEN."
 4. Hold tube in an upright position facing away from you and your cat's face and apply to the back of the neck.



90201067_90201066_90201068

CAUTION:
 Contains a chemical that can irritate the skin. Avoid contact with eyes, nose, mouth, and other mucous membranes. If irritation occurs, wash with water. If irritation persists, consult your veterinarian.
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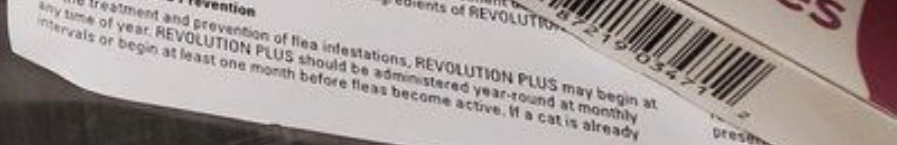
INDICATIONS:
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 Kills flea on cat's body shortly after application.
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DOSEAGE AND ADMINISTRATION:
 The recommended dose is one (1) tube once a month.
 Administer the entire contents of the tube to the cat's back of the neck.
 Administer the entire contents of the tube to the cat's back of the neck.

revolution (selamectin)

Administer once a month to prevent and control flea infestations.
 For use in cats only. Keep out of reach of children.
 Contains 3 doses of 0.25 mL (0.5 mg) of selamectin.

3 Doses
 For the treatment and prevention of flea infestations, REVOLUTION PLUS may begin at any time of year. REVOLUTION PLUS should be administered year-round at monthly intervals or begin at least one month before fleas become active, if a cat is already infested with fleas.



STATION 😊

Choose the best product to prevent all parasites identified today. Look at your choice to find the combination for the prize box!

ascarids, hooks, fleas

- Profender[®]: emodepside and praziquantel
- Advantage II[®]: imidacloprid and pyriproxyfen
- Revolution[®]: selamectin

...and hand washing...
...infectious and...
...at least 2.2 lbs (1 kg)
...The chemical name is Cyclo...
...0-2-(2-hydroxypropoxy)-2...
...0-2-(2-morpholinoethyl)-2...
...carboxylate
...of hookworm infections...
...stage larvae, and tapeworm...
...adults in cats.
...5.45 mg/lb (12 mg/kg)
...one and a second treatment...
...30 days.
...of the cat.
...Praziquantel (mg)
...30.0
...60.1
...96.1
...of the skin is visible.

KEEP OUT OF REACH OF CHILDREN CAUTION

FIRST AID
IF SWALLOWED: • Call a poison control center or doctor immediately for treatment advice.
• Have person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything by mouth to an unconscious person.
IF IN EYES: • Hold eye open and rinse slowly and gently with water for 15-20 minutes.
• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.
• Call a poison control center or doctor for treatment advice.

NOTICE TO PHYSICIAN
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. For medical emergencies call 1-800-422-6874. For consumer questions call 1-800-235-6876.

NOTE TO PHYSICIAN
Treat the patient symptomatically.

PRECAUTIONARY STATEMENTS
Avoid contact with eyes and...

...the lock to claim your prize!
...out where you went wrong 😊
55 4 42 28 53

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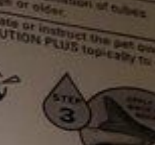
INDICATIONS
Revolution PLUS is indicated for the prevention of heartworm disease caused by *Dirofilaria immitis* and the prevention of flea infestations caused by *Ctenocephalides felis* and *Ctenocephalides canis* in cats and dogs. Revolution PLUS is also indicated for the treatment of ear mites (*Otodectes cynotis*), ear canal infections, and control of sarcoptic mite infestations (*Sarcoptes scabiei*) in dogs and cats. Revolution PLUS is also indicated for the treatment of skin conditions caused by *Sarcoptes scabiei* and *Demodex* spp. in dogs and cats.

RECOMMENDED MINIMUM DOSE
The recommended minimum dosage is 2.7 mg selamectin per pound (6 mg/kg) of body weight and 0.55 mg sarolaner per pound (1.2 mg/kg) of body weight.

ADMINISTRATION
Administer the entire contents of a single tube (or two tubes in combination for cats weighing over 22 pounds) of REVOLUTION PLUS topically in accordance with the following table.

Body Weight (lbs)	Tube Cap Color	Tube Volume (ml)	Selamectin (mg/tube)	Sarolaner (mg)
2.8 - 5.5	gold	0.25	15	2.5
5.6 - 11	orange	0.25	30	5
11.1 - 22*	green	0.5	60	10

* Cats over 22 lbs should be treated with the appropriate combination of tubes regarding the appropriate technician should demonstrate or instruct the pet owner and kittens prior to first use.

STEP 1  **STEP 2**  **STEP 3** 

Firmly press the cap down to puncture the seal on the REVOLUTION PLUS tube. The clicking sound will confirm that the cap has successfully punctured the seal. Remove the cap and check to ensure that the tip of the tube is open. To administer the product, part the hair on the back of the animal at the base of the neck in front of the spine blades until the skin is visible. Place the tip of the tube on the skin and squeeze the tube 3 or 4 times to empty its entire contents directly on to the skin in one spot. Keep the tube squeezed, drag it away from the liquid and lift to remove. Check the tube to that it is empty.

Do not massage the product into the skin. Due to alcohol content, do not apply to broken skin. Avoid contact between the product and fingers. Do not apply to areas where the coat is wet. Stiff hair, clumping of hair, hair discoloration, or a slight powdery residue may be observed at the treatment site in some cats. These effects are temporary and do not affect the safety or effectiveness of the product. These effects are not seen in your ordinary household refuse.

The effectiveness of REVOLUTION PLUS is based on clinical studies that have demonstrated its effectiveness against heartworm disease, flea infestations, ear mites, and sarcoptic mite infestations in cats and dogs. These effects are not seen in your ordinary household refuse.

Write the letters from the corresponding boxes on your answer sheet, then open the lock to claim your prize! If the combination doesn't work, go back and figure out where you went wrong 😊

57 34 14 55 25

Children. In humans, Revolution may be irritating to skin and...
zoetis
Distributed by:

8511000 revolution® (selamectin)


Indications: Revolution is recommended for use in puppies 6 weeks of age and older and kittens 8 weeks of age and older.
• Kills adult fleas and prevents flea eggs from hatching from eggs.

Write the letters from the corresponding boxes on your answer sheet, then open the lock to claim your prize! If the combination doesn't work, go back and figure out where you went wrong 😊

20 38 59 28 25

Store below 30°C (86°F).

LOT
EXP



8511000

revolution[®] (selamectin)

Indications: Revolution is recommended for use in puppies 6 weeks of age and older and kittens 8 weeks of age and older.

- Kills adult fleas and prevents flea eggs from hatching for one month.

eyes. Reactions such as hives, itching and skin redness have been reported in humans in rare instances. Individuals with known hypersensitivity to Revolution should use the product

Write the letters from the corresponding boxes on your answer sheet, then open the lock to claim your prize! If the combination doesn't work, go back and figure out where you went wrong 😊

20 38 59 28 25

children. In humans, Revolution may be irritating to skin and Store below 30°C (86°F).

2721/11

S A S S Y









The fastest team also received the grand prize!

VIRTUAL ESCAPE ROOM

- Easy to create with Google Slides and Forms



A ginger kitten is sitting in a blue litter box, looking thoughtful. The kitten is lying on its side, resting its head on its paw. The litter box is filled with light-colored litter. In the background, there is a window with white curtains and a wooden floor.

**Litter box?
I thought you said thinking box.**

QUESTIONS?

- Do you think you could do this?
- How might you modify the set up?
- Other story lines?
- Ideas to share?

THANK YOU!



Stacey.Benton@uc.edu