Step 1. Let the cat out of the bag!

First, you will need the following supplies:

Now, get a cat. It is in a bag with preservative...we are going to call this the “cat bag”. **Please note if the cat is male or female**, as we are going to have to be careful with some structures on the male cats, but other structures on the female cat. The “cat bag” will tell you this!

Take the “cat bag” over to one of the large sinks near the back of the room. We are going to remove the cat while saving as much of the preservative as we can within the bag. That way, when we return the cat to the “cat bag” after we are done, it will stay nice and fresh (relatively)!

We are going to put the cat back into this bag at the end of lab. Also, anything we cut off the cat will go into the “cat bag”, so it will be in preservative. At the end of the semester, we will incinerate the entire bag, with any remains inside the bag, for disposal.

1. **See the accompanying image.** Cut open the top of the “cat bag” with the heavy scissors. **DO NOT** drain out the fluid!
   - Pull the cat out of the “cat bag”. Wipe off as much of the extra preservative fluid as you can OFF THE CAT into the sink. Place the cat onto your large tray. Have a group member take the tray & cat to your dissection area.
   - Decide on a name for your cat. Meanwhile, have someone grab a large Ziploc bag. Write the cat’s name on the outside of the ziploc bag, using a **sharpie pen**. This way, your group can find your cat’s bag later!
   - We are going to close the top of the “cat bag” with a large rubber band (they are found in the back, near the Ziplocs). Take the “cat bag”, double over the top so liquid cannot escape
   - Now, tie the top using the rubber bands. Double-over the band a couple of times to secure the top.
   - Place the “cat bag” into the Ziploc, and seal the top! You can now put this on the racks in the “cadaver room”.

Don’t forget to name the cat, so you can find your bag later!
Side note: Abdominal Fat Pads

Some cats will have a large amount of adipose and other connective tissues in the “groin” area.

We need to remove as much as possible.

Fortunately, it is superficial to the muscle tissue, and will pull right off! If your cat has these pads, remove as much as possible before beginning the dissection!

That’s right….you can just grab the stuff and pull it off!

You may want to call over your instructor if it is particularly bad!

Try to get the area to look as much as this as possible:
Step 2. Locate some important landmarks!

1. Look into the cat’s mouth. Is there a Styrofoam cube? This was placed there so the cat would not have its mouth closed while preserving it (we’d never get it opened again!). Remove the cube if it is there.

2. Look at the neck. Do you see some strings? This is where they entered the cat’s neck to inject the blood vessels with latex (red in the arterial system, blue in the venous system).

3. First, find the bottom of the rib cage with your fingers. We are going to be careful of this region, as the diaphragm is here, and we do not want to cut through that! See the area marked “A” on the image below.

   Notice the injected blood vessel we can easily see in the leg!

If we have a male cat, we want to make note of the spot labeled “B” on the image below. We never want to cut through this area without the instructor present, or you will have cut the vas deferens (in other words, you will give the cat a vasectomy)!
3. Cutting open the abdominal cavity!

We will be cutting mostly with scissors. We will only use the scalpel if trying to get through something tough to cut with the scissors. **REMEMBER:** you can damage vessels and other organs with the scalpel, but you cannot do much damage with your probe and finger!

First, locate the LOWEST RIB on the ribcage. You are going to want to stop here, because the diaphragm muscle is attached here, and we’d like to keep that as intact as we can.

Make a small incision, with either scalpel or scissors, at the point “A” on the accompanying image. Don’t go too deep, because the guts are just deep to this spot!

Using your heavy scissors, make these cuts in order “1”, “2”, and “3”:

Now peel the abdominal muscle to the side, revealing the abdominal cavity.

Say “eeeeeeewww”.

You can feel the diaphragm muscle by putting your finger up into the cavity, near the top, towards the thoracic cavity. You should be able to remove it from the lowest rib, simply by pulling with your fingers.
4. Cutting open the thoracic cavity!  **Part 1**

We will be cutting mostly with heavy scissors.  We will only use the scalpel if trying to get through something tough to cut with the scissors. **PLEASE HAVE A NICE BIG THICK PAIR OF SCISSORS!**

During this entire step, you will be cutting through and removing small blood vessels that go out towards the ribcage. **IT IS OK... NONE ARE ON YOUR WORDLIST.**

Before beginning, locate the diaphragm by placing a finger on it.

Place your scissors in the spot indicated on the image. **NOTE:** we will be cutting a little off-center, to avoid the hardest part of the ribcage.

Just go ahead and cut the ribcage upwards towards the neck, stopping after you have gone through the first rib/clavicle. Note the trachea (probe is pointing at it image “2”).

OK, now for the tricky part. Once you get to the top of the ribcage, you will hit the clavicle.

Follow the image instructions in red to take off the clavicles on both sides. **Call the instructor if you need help! This step is not necessary, but makes things easier later on!**

**NOTE:** During the next couple of steps, you may come across a large blue vessel called the "internal thoracic (mammary) vein". It is quite large on cats, coming in from the rib cage into the superior vena cava, entering right below the two brachiocephalic veins, and looks like a major vessel. **But it is not on your wordlist, and you will be cutting through it!!!**
5. Cutting open the thoracic cavity! **Part 2**

Put your thumbs under the ribs, and pull it open as far as you can. There will be some connective tissues and small blood vessels under the superior portion... don't worry about them! Let those little vessels tear away, opening the rib cage wide open. Give the ribs a little "crack" to keep the ribcage open!

We are going to cut off most of the ribcage. Yes, your heavy scissors will cut through the bone!

Note the dashed line where I have indicated to cut. This will be easy to cut though until you get to the very top, where you will encounter the clavicle. Cut up towards the head. Snip it completely off!

(On both sides of the ribcage)

Now, we must remove the thymus gland (see image below), which is obscuring the heart, trachea, and blood vessels in the area. Note that it is bigger than you think it is, and is it covering the blood vessels and most of the heart. Pull it away using your fingers...just grab and pull!

Note the heart and lungs. The heart is surrounded by the pericardium, which we will be removing later

Look! We can now see some blood vessels.
6. Getting ready to clean the vessels in the arm!

OK... time for another tricky part. **If you need help with this, call over the instructor.** The shoulder and arm have a lot of superficial muscles hiding the blood vessels. We need to pull or cut them off in order to see the vessels, but we do not want to cut through any vessels we want to study. Try to get started, using the image below (start on the “Start Here”, and go clockwise). Remember: the idea is to get your finger between the blood vessels and the muscles!

As we begin to peel back the muscle, we see blood vessels and nerves all bundled together just underneath the muscle. Don’t worry; they won’t be harmed as long as we keep scissors and scalpel away!

I’m lifting some up with my probe in the image.

Kea9 pulling as much of the superficial muscle as you can without cutting, pushing down on the blood vessels with your finger while peeling the muscle up. Like skinning a chicken!

But eventually, you will have to cut some off … especially near the elbow and part of the pectoralis and deltoid on the front, which comes down and covers the biceps.

Just keep your scissors or scalpel away from the blood vessels!

**Done!**

Now, you only have one thing left: cutting away the brachial plexus. **See later step!**

Some people’s cat will not be well-injected in this area. Sometimes the latex doesn’t fully penetrate the vessels. If you cannot see “red” and “blue” vessels, this may be the case for your cat. Call the instructor over and ask for guidance.
7. Name some things in the abdomen, and remove the Greater Omentum (but keep it for later)

OK, we see the Greater Omentum. It is a large apron-like fold of visceral peritoneum that hangs down from the stomach, but it is not attached at the bottom. It lies on top of the organs of the digestive system, and can easily be removed.

1. Lift up the bottom of the intestines.

2. Simply peel it off the underside of the small intestines. Keep pulling it up off the intestines until you reach where it is attached to the stomach.

3. Now, you will have to cut it off the stomach. See accompanying image.

4. We will be saving this for later, when we study the digestive tract. So either put it in your "cat bag" now, or leave it on your tray for later.

5. Notice that the visceral organs have a shiny coat, or visceral peritoneum, on their surface. The parietal peritoneum can be seen on the inner abdominal wall. At this point, you may notice a lot of fluid in your cat's body cavity. This is the preservative. Some cats have a lot, others have very little. If your cat has so much that it is interfering with the dissection, call over the instructor and ask for instructions on removing this fluid at the large sink (take the tray with you!). Another fold of the peritoneum is the mesentery. It attaches the intestines and other organs to the body wall.

6. Un-loop a little of the small intestines, revealing the mesentery. Notice all the blood vessels it contains.
Side note: Exploded Kidneys!
(Or .... some other explosion)

Sometimes the latex is injected at too high of a pressure, and blood vessels “pop”! The veins of the kidney are especially prone to this, but it may occur in other areas as well!

Don’t panic! Call your instructor over!

The latex can often be removed with forceps
8. We want to locate some abdominal structures we do not want to damage!

First, gently move the abdominal viscera to the cat's right side (your left).

Now, we need to locate a couple of structures that we do not want to damage.

Kidney – the image below is a female cat, so there are some differences if it is a male cat. See that large “adipose capsule” surrounding it, and holding it in place? We want to leave that alone for now. Do not remove it unless your instructor tells you to. Also, locate the ureter. Don’t destroy this while dissecting (see lowest image “4”).

Inferior mesenteric artery – This one is tricky to find, and students often accidently remove it when they are removing the membranes surrounding the aorta and inferior vena cava. Remember from last week’s lab: it is the first large branch inferior to the renal artery. Look at an image if you do not remember. Gently pull up the colon, as seen in the image below. Look in this area, following the instructions in the image. It will not look very large until we clean up these membranes (see lowest image “5”).
9. This is for groups with a female cat only!

If you have a female cat, it is time to look at the reproductive tract in order to protect it. We will locate the uterus and ovaries, because there are some membranes and ligaments we want to protect.

Your viscera should still be off to the cat’s right. Locate the uterus and ovaries, using the image below.

Grab the left ovary GENTLY with forceps, and GENTLY pull it up a little to see the membranes that hold it in place.

Now follow the uterus up to the ovaries, being careful to not destroy the membranes holding the reproductive tract in place. Locate the structures seen in the image, although you do not have to name the gross organs yet! We will in the reproductive system lab!

Note the blood vessels on image 4! Those are on your wordlist. Leave them be!

Please call your instructor over, when cutting in this area, and let them point out the ligaments so you do not cut them!
10. This is for groups with a male cat only!

If you have a male cat, we need to be careful cutting through the pelvic floor.

Remember earlier, I told you to watch out for this area:

Let's take a closer look (see image below). Do you see where the femoral artery & vein connect up, in the body cavity, with the iliac? See how they go through the body wall? Do not cut the wall here unless the instructor is present, as the vas deferens passes close by, and we want to preserve that for the reproductive labs!

Please call your instructor over, when cutting in this area, and let them point out the vas deferens so you do not cut it!
11. Getting ready to clean the vessels in the leg:

Let’s talk about what we mean by “Cleaning up the blood vessels”!

You will be removing protective membranes and facia that hold the blood vessels in place within the body, but which make identifying them difficult. Worse, these membranes make it impossible to see where arteries and veins branch, which is where they change names!

Look at the leg. Do you see some “blue vessels” running down the thigh? Let’s use these “simple-to-remove” membranes as an example.

Take your FINGER and pull away the membranes near the “crotch”. They easily pull away (see points “1” and “2” on the image below). See how far you can go down the knee, removing the membranes with just your finger. Eventually, the membranes will get tougher, and you may have to switch to your probe. Try to make your cat’s leg look as much as the image on the right as you possibly can!

Look at the lower image. Try revealing the femoral artery with your probe, as seen in the lowest image. Pull on them gently using your probe. See how stretchy the vessels are? No needs to be overly cautious, as the vessels are pretty tough. If you think about it, they stretch quite a bit just with your normal leg movements. Think how much they stretch during yoga class!

Don’t worry; the cleaning doesn’t have to be perfect. We’ll come back to the leg later.
In Image “1”, I am cleaning up a vessel in the neck: If you want, you can try this with the arteries in the neck, near where the injection site is …. BUT BE AWARE, the common carotid has often been cut on one side in order to inject the latex!

One person should begin working on the neck and arm, while another should begin working on the leg and abdomen. Do not start identifying the vessels until they have been revealed thoroughly, so you can see the branchings of the vessels.

In STEP 14, there are images showing you some “before” and “after” pictures you can refer to while performing the “cleaning up” portion of the procedure, so you can see where you are going with this.

**ONE LAST THING YOU SHOULD KNOW:** There are different challenges in the “arm and neck” region versus the “leg and abdomen” region:

1. The person working on the neck will have 2 small challenges: the brachial plexus and the parietal pericardium. See STEP 12 for instructions on dealing with the nerves, and STEP 13 for help removing the pericardium.

2. The person working on the abdominal region will have 2 main problem areas: the inferior mesenteric artery and the celiac trunk. See the previous STEP 8 if you haven’t already dealt with the inferior mesenteric artery. Since the Celiac trunk won’t be gotten to until near the end of lab, this guide will let the instructor help you with that.

Image “2” reminds you of what you saw in STEP 8.

**The very last step, STEP 15, gives you instructions on cleaning up your area after you are done!**
12. Those gosh darn nerves in the arm are in the way!

*If you need help with this, call over the instructor*

In **STEP 6**, we noticed that the armpit region has a lot of nerves. This is the Brachial Plexus (remember it from A&P??).

These nerves cover and obscure the arteries in this region, and should be removed. **Follow these instructions on the image:**

- Use your probe to separate the nerves from the vessels.
- Pull on a nerve. When you are sure it is away from the vessels, snip it off. **RULE:** if it is beige, you can cut it!
- Keep doing this until the vessels are completely free and identifiable.
13. Removing the Parietal Pericardium!

If you need help with this, call over the instructor

OK, so you’ve got most of the vessels revealed in the arm and neck. But a lot is being covered by the parietal pericardium and mediastinum. For example, we can’t see the aortic arch. Let’s remove them!

First, locate the parietal pericardium. Remember: you are not going to want to cut too deep, which would damage the heart and aortic arch. Now, look at the image below, and follow its guidelines:

Cut along the heart, and then the aortic arch, without going deep.

Then peel back and remove with forceps. You might have to tear it a little to get it off!
14. Some “before” and “after” images, and some special vessels to watch out for! PAGE IN PROGRESS – NOT FINISHED
15. Clean up after yourself!

Take cat on tray, and all dissection equipment, to large sinks at back.

Put cat, along with any large dissected parts (greater omentum, large pieces that were removed such as the rib cage, etc.) back in bag, seal Ziploc, and place on rack in “cadaver room”. You will find a shelf marked with your lab’s day and time...place your cat there.

One person cleans tray, one person cleans dissection tools, one person cleans table top.

*Note the bucket in back marked “For Dissection Materials Only” ... this is where you will throw away any small leftovers! You probably want to leave your gloves on until you are finished cleaning. Do not throw gloves, etc. in “Dissection Material” bucket...you use the regular trash for that!*

**Tray:**

Rinse off blue rubber pad and tray. Take back to cadaver room, and place on the “drying rack”. Remove large blue rubber pad, laying it “skewed” over the tray so the bottom can dry.

Check the sink for any “pieces”, especially hair and other parts by the drain! Spray down the sink and rinse.

**Dissection equipment:**

This can be done by the small sink. Scrub lightly with brush to remove fat, etc. Place in drying can in the sink. Be sure to place scalpels “pointy-end down”!!!

**Table Top:**

Grab a bottle of “table top cleaner” and some paper towels. Clean thoroughly! Check the floor for extraneous “pieces”. Put the chairs back where they go!