Bachelor of Fine Arts
In Scientific Illustration

ARGD3340 Senior Exit
Amy Sands

"Gray Whales Off the Coast of Georgia, USA"

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Gray Whales Off the Coast of Georgia, USA
Artist Statement:

Gray whales have always intrigued me. The mystery that surrounds these gentle giants and the shear impressiveness of their anatomy and physiology I believe is one of the many miracles of nature. The objective for this project is to inform the audience of the recent discoveries made at JY Reef located off the coast of Georgia. Scott Noakes, a research scientist with the Center of Applied Isotope Studies at the University of Georgia, discovered a 36,000- year old Gray Whale mandible 20 miles off the coast of Georgia in August 2006. The bone specimen was then reassembled at Emory University. Photos where then sent to the Smithsonian Institution National Museum of History for identification and casting. Later excavations at JY reef uncovered a second Gray whale mandible determined to be at least 46,000 years old.

It was my pleasure to paint one of these to replicate the original. In addition to painting this cast, I have included illustrations of the second whale mandible found and how these fragments fit on a whole Gray whale mandible. And to give my audience a clearer understanding of where a Gray whale mandible is in relation to the whole skeletal structure I also illustrated the skeletal system so one could be more familiar with this specimen.

Process of Painting the Cast

The process involved in painting the gray whale mandible casts took a lot of time, space, and trail and error.

The first step was to paint all the casts completely black and then applying another coat of black paint. After the paint dried, the casts were sprayed with a UV-resistant spray.

(Original Mandible)

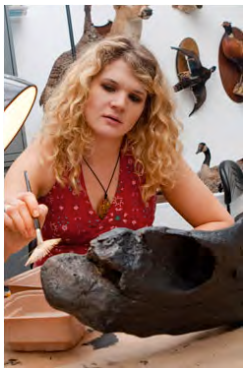
(Line up of the casts: not painted)

(Starting with the first layer of black paint)

(Full painted black cast)

Next, color was mixed to emulate the hue of the darkest layer found in the original whale mandible thus allowing a gradual change of shade throughout the cast. Then adding lighter colors to the original color used to paint the darkest color created highlights. A fan brush was used to lightly dust on color to achieve the textured look of the original mandible, and darks were pushed in areas of greater depth by wiping the darker color away from the raised surface.

(Final Painted Cast)



Research

The Gray Whale *(Eschrichtius robustus)* is a large whalebone whale (Tinker, 272). Some identifying features are they have a curved rostrum, no dorsal fin, large flippers, and are covered with many scars (272). Gray Whales are very similar to the Right Whales and the Fin-backed whales (272). Their length can range up to 49.2' and can weigh as much as 35 tons (272). Their coloring consists of dark grey or a bluish grey with barnacles, cuts, and bites from outside sources (272). Gray Whales are typically located along the west coast of the United States ever since whalers wiped them out. However, with the discovery of the two Gray Whale mandibles twenty miles off the coast of Georgia, there has been questions brought up in the science community like "Why would a gray whale 36,000 years ago be on the coast of Georgia?" and " What else don't we know about gray whales that can be unlocked through this discovery?"

Research scientist Scott Noakes, with the Center of Applied Isotope Studies from the University of Georgia, Athens, made the first discovery in the fall of 2006. During one of a dive twenty miles off the coast of Georgia at JY Reef, Noakes was conducting studies on a shell bed when he saw something out of the ordinary (Noakes, 2009). The bone fragment was uncovered and brought to the surface. The mandible was then transferred to Emory University and reassembled. The reassembled mandible was moved to the Smithsonian National Museum of Natural History (SNMNH) where it was identified and four casts were made (Noakes, 2009).

It was not till a later dive in August 2010 that more fragments were discovered in JY Reef. Three bone fragments were found 170 m northwest of the first whale mandible sight (Noakes, 2009). Once again the same conclusion as the first finding showed another left whale mandible of a Gray Whale found to be 46,000 years old. It was surprising there were now two Gray Whales in close proximity only 10,000 years apart (Noakes, 2009).

[1] Tinker, Spencer Wilkie. *Whales of the World*. Leiden: E.J. Brill, 1988. Print.

[2] Noakes, Scott E., Ervan G. Garrison, and Greg B. McFall. "Underwater Paleontology: Recovery of a Prehistoric WhaleMandible Offshore Georgia." Diss. Center for AppliedIsotopeStudies, The University of Georgia, Athens, 2009.Abstract. *Pollock NW Eds. Diving for Science 2009* (2009): 245-51. Print.

What is Scientific Illustration?

Scientific illustration is teaching through art. Without scientific illustration many concepts and ideas could never be comprehended, and many beautiful aspects of nature never seen. Without scientific illustration learning about the natural world would be impossible and not nearly as amazing.

My senior thesis is a perfect marriage of science and art. The technology and research it took to procure the Gray Whale mandibles, the knowledge it took to reassemble the bone fragments, and the chemistry involved dating these bones is the definition of a scientific process. However, the one thing this research lacked was the artistic touch needed to help reach the audience and tell about the amazing and wonderful things discovered at JY Reef.

This project not only pushed my illustrating skills and Photoshop techniques, but also introduced a new wing of science illustration to me. Painting the cast was one of the greatest challenges in my student career. An opportunity like this has never presented itself to me till now, and I must admit my nervousness about starting this process of painting a cast to emulate a 36,000-year-old Gray Whale mandible. This project has a wide variety of mediums and techniques used, and tests all my artistic skills.

The research involved was also important to my well roundedness as a scientific illustrator. In science illustration one has to be well informed and knowledgeable of what they are illustrating so they in turn can visually communicate an idea to the intended audience. As I said before, science illustration is a teaching tool. Without accurate information the imagery would be wrong and misinformation would be circulating and confuse many. Can you imagine what a biology textbook with inaccurate illustrations of the human skeletal system does to a whole class of students? If these students moved on to higher levels of education they would be far behind others and have to relearn the correct information. The artist is key in teaching.

My senior thesis has given me the opportunity to visually teach my audience about the discoveries made at JY Reef. I have wrestled with ideas of illustrations imperative to revealing information like where a whale mandible is in relation to the rest of the whale, or which pieces of a Gray Whale mandible were found in relation to the entire bone. These puzzles were challenging and fun to solve, and have given me the experience I need to tackle other projects in the future.

Art is my passion, and showing others what they cannot see with the naked eye is not only a personnel challenge, but also a privilege. Helping people learn as well as learning new things through the process of working on a project makes it all well worth it.

Resume

Education:

University of Georgia, Athens, GA
Major: BFA Science Illustration 08/09- present

University of South Carolina, Columbia, SC
Major: BFA Graphic Design 08/06-05/09

Activities:

University of Georgia Running Club 08/09- present
Oconee County Animal Shelter Volunteer 03/10-present
President of The Fencing Club at USC 08/08- 05/09
USFA Executive Officer for the South Carolina Division 08/08- 05/09

Honors and Awards:

H.O.P.E. Scholarship Recipient
LIFE Scholarship Recipient

Employment:

Roper Services 05/08- present
Creative Agents Inc. 05/06- present

Exhibitions:

2011 Scientific Illustration Senior Exit Exhibition

2011 Annual Student Scientific and Medical Illustration
Joint Exhibit, University of Georgia: Lamar Dodd
School of Art; Athens, GA

2010 Annual Student Scientific and Medical Illustration
Joint Exhibit, University of Georgia: Lamar Dodd
School of Art; Athens, GA

ARGD 3340 Senior Exit
Final Approval

Date:

Student:

Title:

Approval:
I have reviewed the final presentation/ exhibition of the students Senior Exit and approve the project as partial fulfillment of the requirements for the Degree of Bachelor of Fine Art in Scientific Illustration.

_____
Science Advisor

_____
Art Advisor

Approved:

_____ _____
Area Chair, Science Illustration Program Date

Amy Sands
02/11/ Spring 2011
ARST 3340
Advisory Committee

"Gray Whales Off the Coast of Georgia, USA"

OUTLINE

I. Description- I was given the opportunity to help paint a cast of a Gray Whale mandible fragment discovered in the fall of 2006. Aside from the painted cast I will include illustrations of the gray whale in its natural habitat, and a gray whale skeletal system (so the mandible I would be could be put into context), as well as illustrations of the two Gray Whale mandibles (medial and lateral views of each) and how the fragments of these bones relate to a full mandible. The illustration of the Gray Whale in its natural habitat will be joined with an illustration of the skeletal system. The other illustrations will be displayed on two separate posters, each poster with the medial and lateral views of the full mandible with the fragments fully rendered. Included on these posters will be a brief statement discussing how and where these specimens were discovered and how they were handled afterward.

Purpose- I am creating this document because the discovery made by Scott Noakes is ground breaking and the general public needs to know about it. This gray whale mandible proves that there is more to the gray whale then we thought we knew and it raises questions like "Why would a gray whale 36,000 years ago be on the coast of Georgia?" and " What else don't we know about gray whales that can be unlocked through this discovery?"
Is perfectly related to scientific illustration. Not only are the subject matter science based, but the marriage of science and art to demonstrate to the viewer what research scientist Scott Noakes discovered is a perfect example of scientific illustration. I say this because it is crucial for an audience to see a visual of what a mandible looks like and where the bone fragments are in relation to it.

Audience- The intended audience would be anyone from the age of +16 years. I would like this information to be presented in a way that almost anyone can understand, because I want this research to reach a large number of people.

Objectives- The intentions for this project are to make my viewers aware of the recent discovery made by Scott Noakes. I want my illustrations to show the gray whale in its natural habitat, the skeletal system, as well as the fragments found. This will then put the painted cast into context for my viewers. From this project I hope to learn the process of painting castes and the experience of collaborating with a scientist.

Communication Mode- The whale mandible caste will be presented in the glass case of the Scientific Illustration hall, and my posters will be along side the caste. I would also like to include photographs from the excavation on the computer in a preview show.

Budget- The costs of the paint for the caste are already covered. The only remaining cost would be that of the posters, which I estimate the cost for printing would be about $150.

II. Index of Illustrations-

a. Gray whale in its natural habitat
b. Lateral view of the gray whale in its underwater environment
c. Paint the whale in Photoshop
d. Gives a clear illustration of what a gray whale looks like
e. Realistic for the purpose of identifying the specimen for my audience
f. 16”x20”

a. Gray whale skeletal system
b. Lateral view of the gray whale
c. Line drawing (pen and ink)
d. It illustrates where the mandible is in relation to the whole whale skeleton
e. A very tight pen and ink drawing is important to keep it accurate and precise
f. 4”x5”

a. 36,000 year- old Gray Whale mandible
b. Lateral view and medial view
c. Graphite drawing with outline of full Gray Whale mandible illustrated in Photoshop
d. Relates discovered bone fragments to a full mandible
e. Well rendered and accurate
f. 11”x14”

a. 46,000 year-old Gray Whale mandible
b. Lateral view and medial view
c. Graphite drawing with outline of full Gray Whale mandible illustrated in Photoshop
d. Relates discovered bone fragments to a full mandible
e. Well rendered and accurate
f. 11”x14”

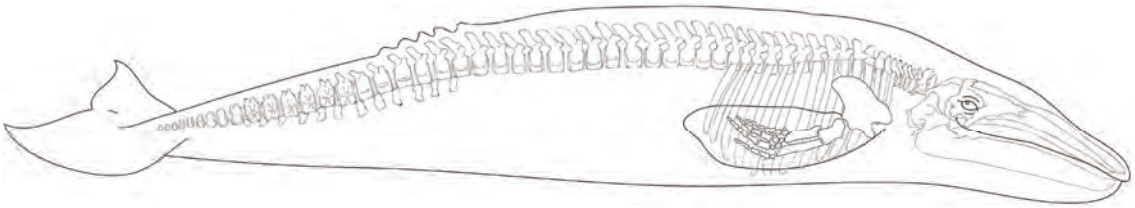
III. Final form of presentation- The caste of the whale mandible will be presented in the glass case in the Science Illustration hallway. The posters will be presented along side the caste and original mandible inside the case. I would also like to include a computer in the case with a preview show of the excavation and process of painting the cast.

46,000 year-old Gray Whale mandible including a lateral view and medial view rendered in Graphite with an outline of a full Gray Whale mandible illustrated in Photoshop. This is for the audience to be able to relate the discovered bone fragments to a full Gray Whale mandible.

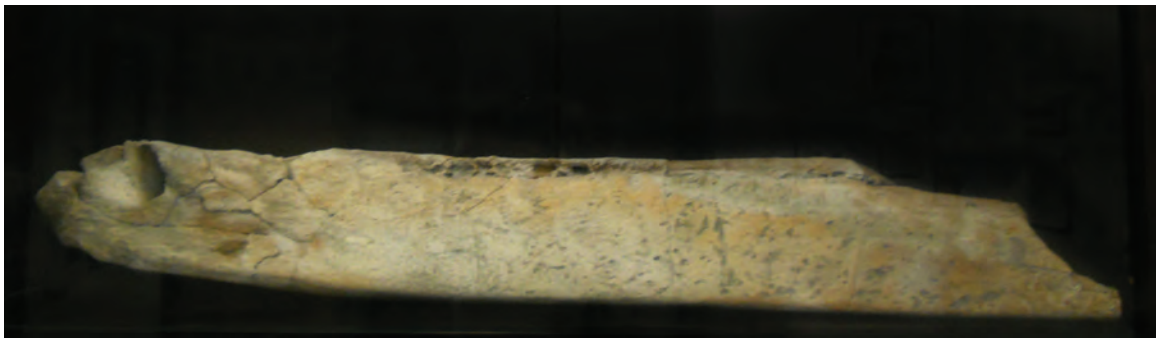
Medial View

Lateral View

36,000 year-old Gray Whale mandible including a lateral view and medial view rendered in Graphite with an outline of a full Gray Whale mandible illustrated in Photoshop. This is for the audience to be able to relate the discovered bone fragments to a full Gray Whale mandible.



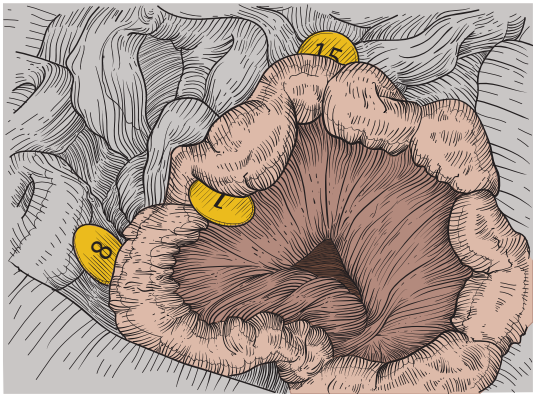
Gray Whale Skeletal System:
This illustrates to the audience where the mandible is in relation to the rest of the Gray Whale skeleton and just how impressive it is scale wise.



Medial view of the final painted Gray Whale left mandible cast.

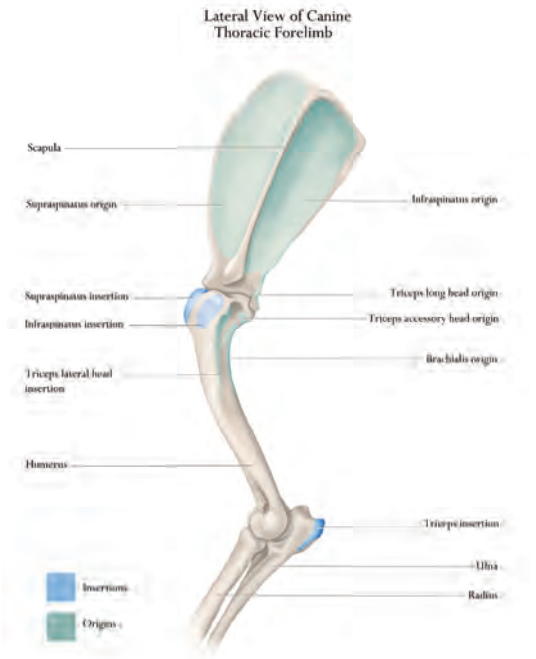
Gray Whale in Natural Habitat:
This illustration was important to include as a reference for my audience. There are 78 species of whales, dolphins, and porpoises in the Order Cetacea and to expect someone to visualize a certain specimen without an illustration would make it difficult to make my point clear.

20 Additional Images of Artwork Created Throughout Scientific Illustration Program

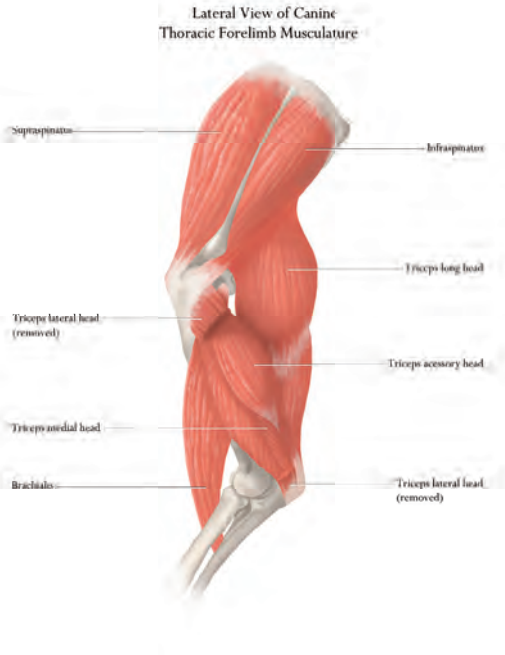


Title: Cadaver
Objective: To illustrate a point of focus in the intestinal area.

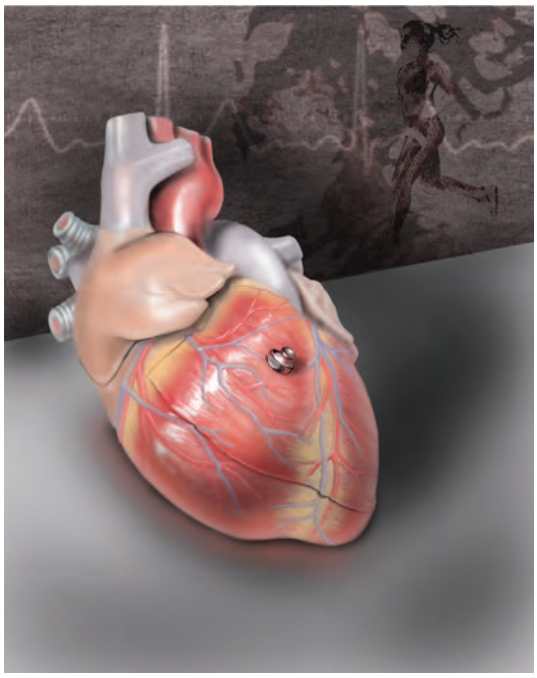
Title: Chipmunk
Objective: An accurate rendering of a chipmunk in pen and ink.



Title: Lateral View of Canine Thoracic Forelimb
Objective: To accurately render a canine forel

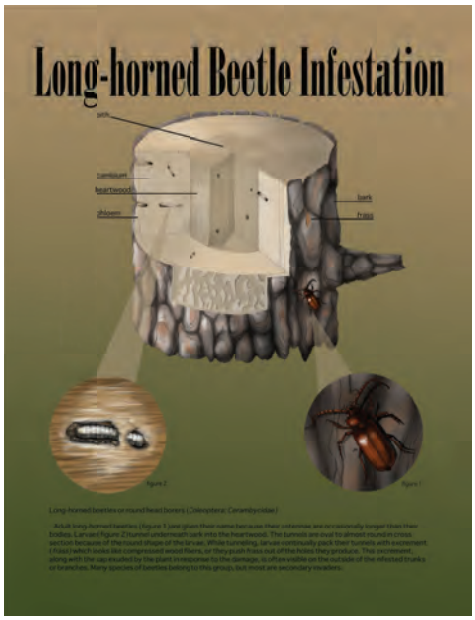


Title: Lateral View of Canine Thoracic Forelimb Musculature
Objective: To accuratley describe forelimb muscles.



Title: Heart Model
Objective: To create a still-life including an anatomical model.

Title: Still Life
Objective: To create a still life in watercolor.

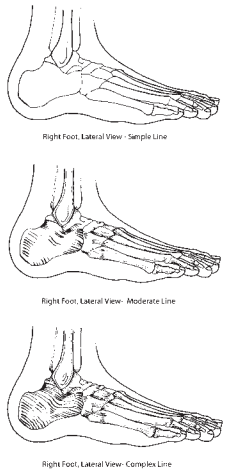


Title: Long-horned Beetle Infestation
Objective: To illustrate a poster with a cross-section.

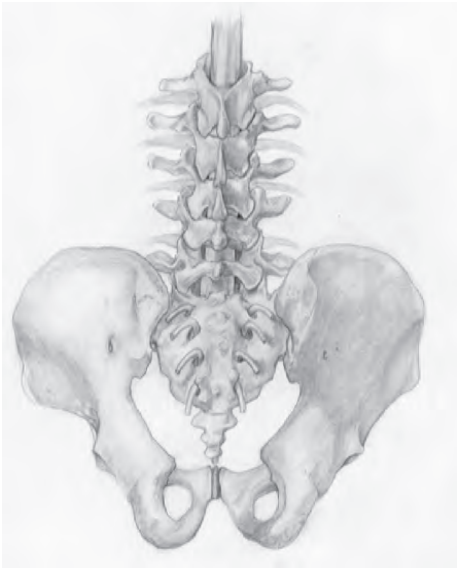
Title: Hand Illustration
Objective: To create an illustration with hands manipulating latex gloves.

Title: Feet Illustration
Objective: Watercolor rendering of right foot ventral view and right foot dorsal view.

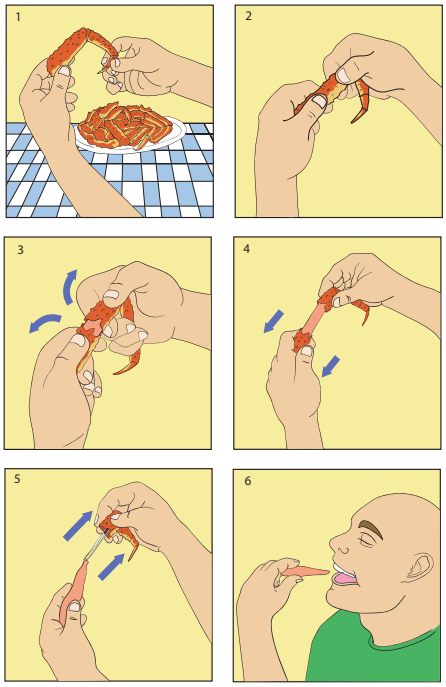
Title: Carrion Beetle
Objective: To accurately describe a carrion beetle in graphite.



Title: Progressive Foot Rendering
Objective: Pen and ink drawings of the right foot lateral view with increasing line work.



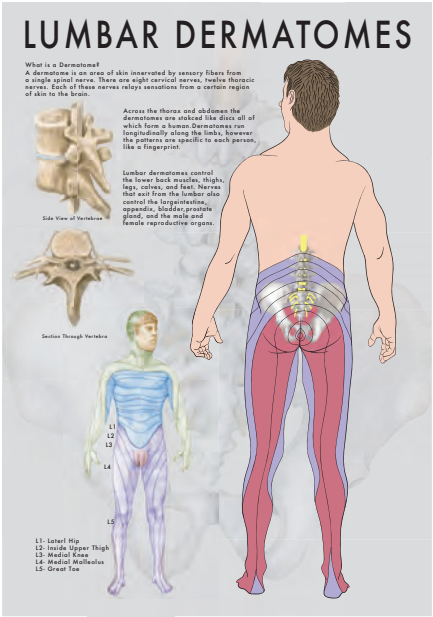
Title: Lumbar
Objective: Graphite rendering of the lumbar and nerves.



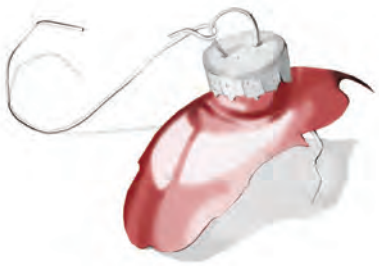
Title: Six Steps
Objective: To illustrate in six easy steps how to eat snow crab legs.

Title: Luna Moth Larva
Objective: To illustrate in watercolor a specimen in its natural habitat.

Title: Editoral Illustration
Objective: To illustrate an editorial cover to a science related magazine.

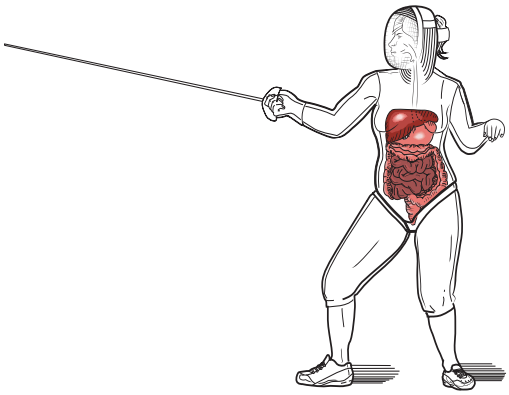


Title: Lumbar Dermatomes
Objective: To create a poster describing the lumbar dermatomes including illustrations.

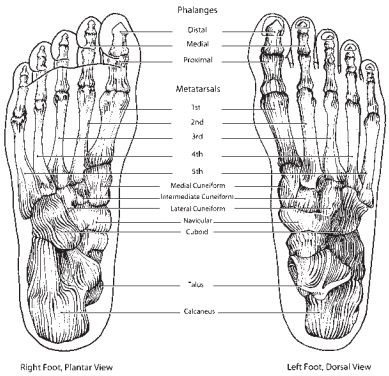


Title: Ornament
Objective: To illustrate in Photoshop an ornament with special attention to detail.

Title: Hibiscus Lasiocarpus Cav.
Objective: A watercolor illustration of a pressed specimen.



Title: Digestive System
Objective: To illustrate the digestive system in the human body.



Title: Feet
Objective: Pen and ink illustration of right foot plantar view and left foot dorsal view.

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