FANTASY & SCI-FI DIGITAL ART
ImagineFX
PRESENTS

HOW TO DRAW AND PAINT

ANATOMY



Creature drawing skills

Master the proportions, poses, bones and muscles of animals

FROM HEAD TO FOOT



How to draw and connect the simple shapes that make up the human body

Discover how you can draw and pose figures in proportion



Learn how to transform your sketch into a digital image



85 PAGES OF WORKSHOPS

Learn practical drawing skills and techniques from professional artists



VOLUME 1



Drawing legs with Ron Lemen.
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ImagineFX Presents

HOW TO DRAW AND PAINT

ANATOMY

Welcome...



If you're reading this, the chances are you're an aspiring artist on a journey of self-improvement. Whether you're at college, hoping to become a professional artist or just want to create art for yourself, you've come to the right place.

The following pages in this special edition of ImagineFX are filled to bursting point with the best anatomy advice around. Every page is packed with easy to follow, step-by-step guidance on how to create better human and creature figures, written and illustrated by professional artists. Essentially, it's years of attending art college distilled into one magazine.

The accompanying disc provides you with an opportunity to get closer to the annotated sketches, watch videos of anatomy drawing in action, and see high-resolution digital art files to help you learn how to take your sketches into digital art software.

For those of you who are new to the world of ImagineFX, turn to page 97 to see just a fraction of the digital art workshops that we feature every month in ImagineFX.

Also, make sure you check out page 115 for a sneak preview of what's coming up in our How To Draw And Paint series. We're sure you'll love them all. If you have any questions, please get in touch with me at the email address below.

Claire

Claire Howlett, Editor
claire@imaginefx.com



From the makers of ImagineFX

We're the only magazine dedicated to fantasy and sci-fi art. Our aim is to help artists to improve both their traditional and digital art skills. Visit **www.imaginefx.com** to find out more!

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US and Canadian readers: please turn to page 96



FANTASY & SCI-FI DIGITAL ART ImagineFX PRESENTS

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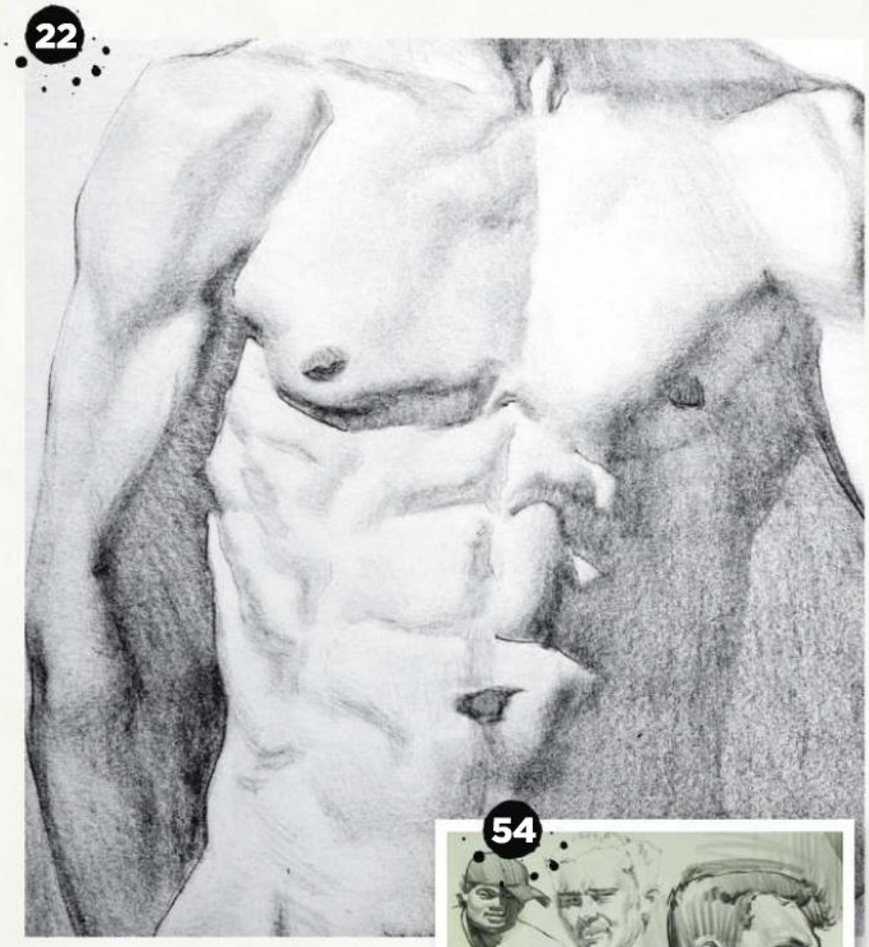
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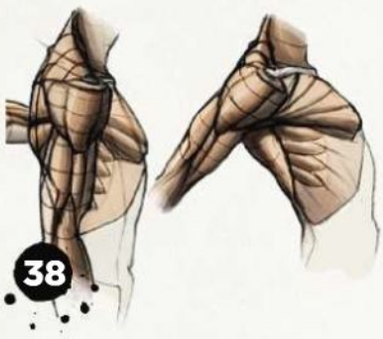


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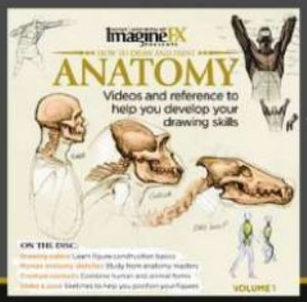
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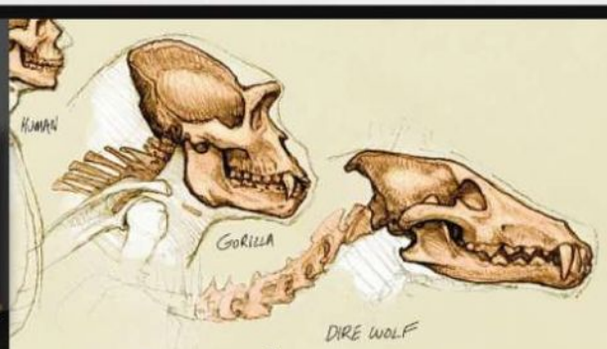
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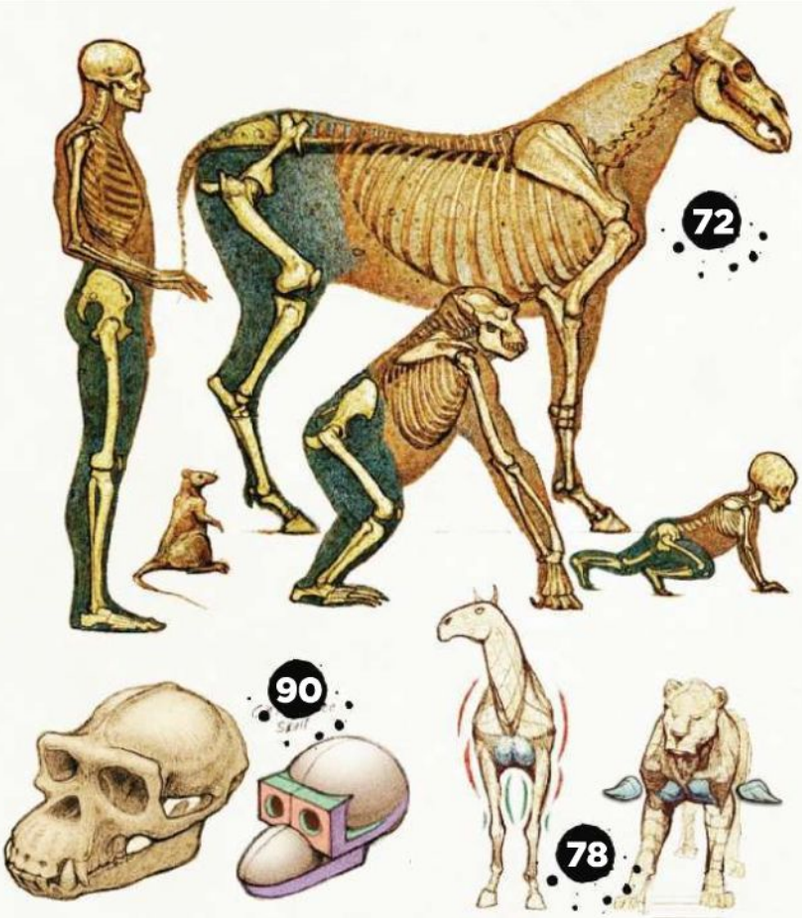
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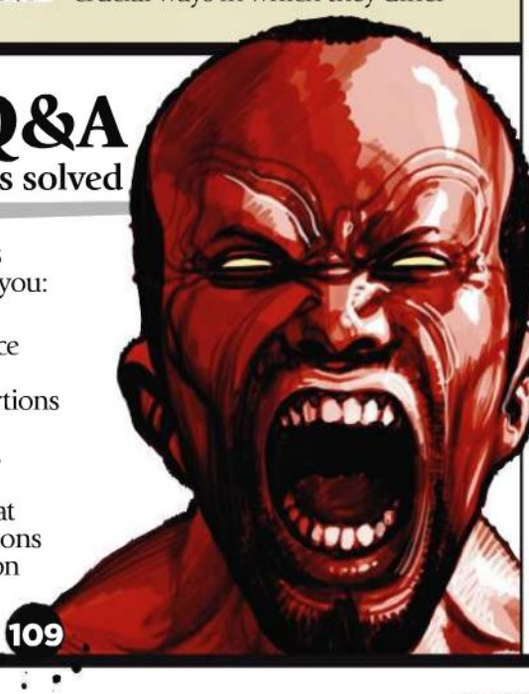
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- Draw expressions that show the right emotions
- Pose figures in motion
- Shade faces better



The Gallery

SHOWCASING ANATOMY AND FIGURES IN FANTASY ART

Paul Bonner
LOCATION: Denmark
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EMAIL: bonner@mail.dk
MEDIA USED: Watercolour



"Most of what I do stems from a childhood passion for fairytales, myths and legends," says Paul. "They sparked a myriad images and incessant scribbling, trying to draw my own versions."

Since then, with the help of brushes and tubes of watercolours, Paul has been continuing along that same path. "Always knowing what I wanted to do made it an easy path to follow," he says. Paul has made a successful career for himself that's at least partially a result of his stubborn self-direction.

Apart from the need to try and empty a cluttered imagination, Paul's driving force is the basic thrill of creating something out of nothing. Obviously this nothing is not absolute: "It's made up of a myriad influences that seep in over the years." Books, films, other artists, music and nature are all-important ingredients.

The challenge is to make something believable. "I deal in myths and legends," says Paul, "and if I can get people to suspend disbelief and accept the reality of what I'm painting although they know otherwise... Well, then, I'm a happy guy."



© Riotminds

1 DRAKAR OCH DEMONER
15x22in, watercolour on paper
Paul revels in the chance to paint rocks, stones and water, and these guys in a boat were a great opportunity. This piece was painted for Riotminds.

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The Gallery



© Riotminds



© Riotminds

2 ELD OCH SOT
15x22in, watercolour on paper
"Dwarves, trolls, stones carved into figures or runes," says Paul of this piece for Swedish RPG makers Riotminds. "That just about sums it all up really."

3 TRUDVANGS STIGAR
13x25in, watercolour on paper
This dwarf is in a bit of trouble: he's been captured by some trolls. But this piece for Riotminds gave Paul a chance to paint one of his favourite things: "Nature again... stones and roots."

4 CONFRONTATION
27x16in, watercolour on paper
Paul admits that this piece, painted for miniatures company Rackham, was a nightmare to draw, given all the figures. "But it was fun trying to give so many individuals good reasons to be there."



© Rackham

The Gallery

Tom Kidd

LOCATION: US
WEB: www.spellcaster.com
EMAIL: tkidd@snet.net
MEDIA USED: Oil on panel

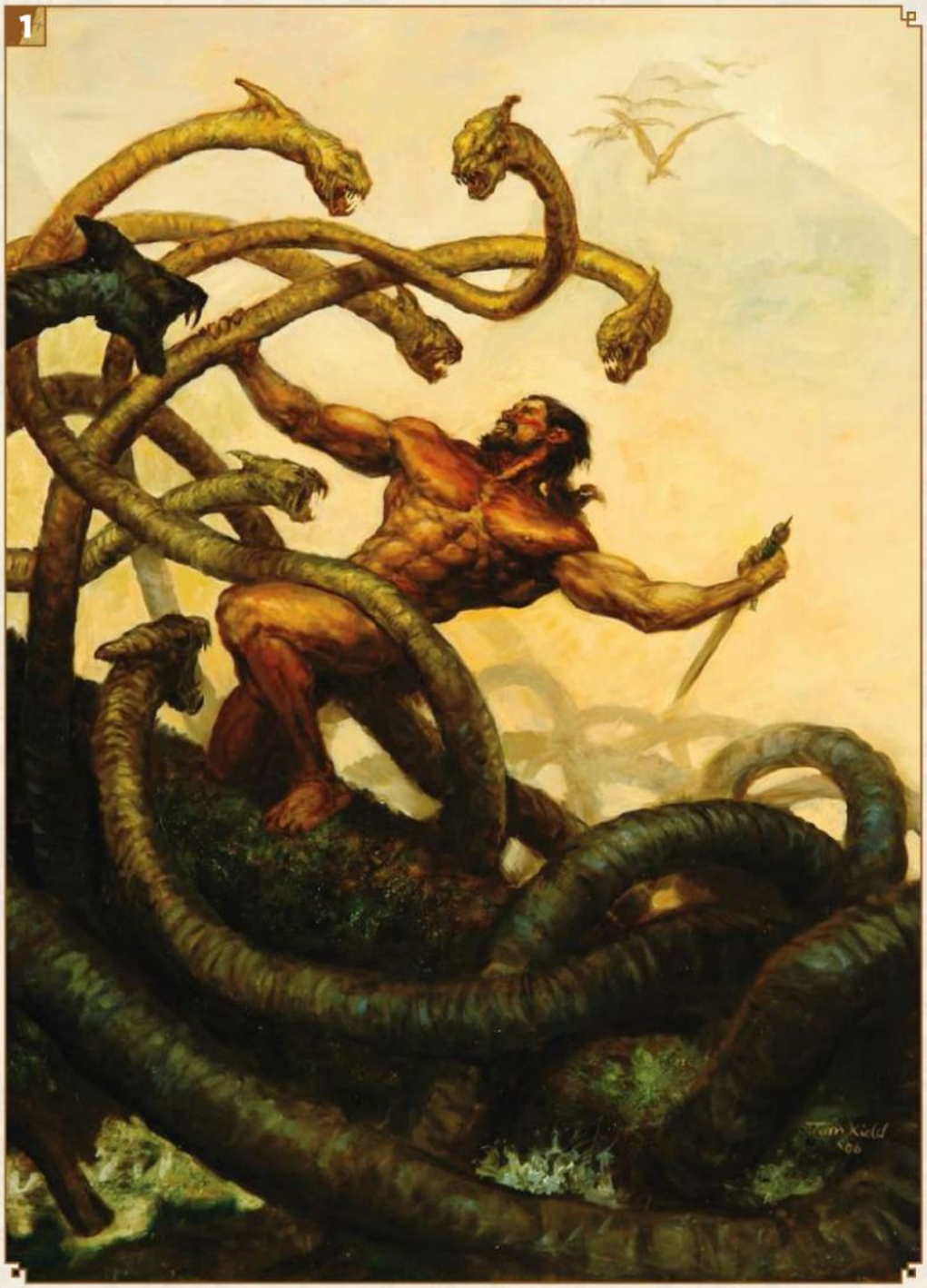


Tom realised he could draw when he was very young. Anything he set his mind to, he could copy – but he quickly realised that could be accomplished by robots or machines. To differentiate himself from the Xerox, Tom began making things up to draw, and so a career was born.

Tom's role models as he grew as a person and an artist included Chesley Bonestell and Norman Rockwell. Taking on their influence, Tom began working towards the goal of becoming a fantasy illustrator. He won a scholarship to Syracuse University, but dropped out after two years and moved to New York, intent on making a career for himself. After a short while, he began to see success in his chosen path.

Tom has worked for a number of publishers, Baen Books, Tor and Marvel among them. He's won a World Fantasy Award (Best Artist 2004) and seven Chesley Awards. He's also busy with a personal project, which he describes as "my favourite and most time-consuming obsession." Called Gnemo: Airships, Adventure, Exploration, you can see lots of art for this project on Tom's website.

1



© Harper Collins 2001

2



1 HERCULES VS THE HYDRA
16x20in, oil on panel
Part of a mythology series Tom painted. The other characters he painted are Odysseus, Theseus and Perseus.

2 REINDEER EXPRESS
13x28in, oil on panel
If you receive Christmas cards from Tom, you'll already be familiar with this image. "As I painted it, I came up with a children's book idea to go with it," he says. "It's an attempt to rationally explain Santa Claus, but as the story goes on it, becomes quite convoluted and even less plausible."

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Duc Truong Huyen
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SOFTWARE USED: Photoshop



Although Duc has studied at Ho Chi Minh City's University of Architecture, he had never drawn anything seriously until senior year in high school, when he finally picked up a pencil in a bid to improve his chances of being accepted to study architecture.

"At first, drawing was my hobby," says Duc. "That was until I saw Ryan Church, Dylan Cole and Daniel Dociu's masterpieces." The result was profound and immediate. "I was in awe, and decided to buy an Intuos 3. This decision has completely changed my life."

Although he's self-taught, Duc says he's had some help along the way. "Thanks to ImagineFX, DeviantART and CGTalk, I have many sources to study and improve my skills, not to mention my knowledge from architecture."

1 ENTRANCE OF COVERED
Illustration for a personal project. "It's about a girl who owns a fairy tale book, which is actually a gate to connect two worlds together."

2 ADERA
All Duc wanted was a playful portrait "with strong warm and cool colour values to present my character, the Seeker of Balance".

The Gallery





Sophia Kolokouri
LOCATION: Luxembourg
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EMAIL: mysideworld@yahoo.com
SOFTWARE USED: Photoshop



After studying animation and design at Gobelins in Paris, Sophia started working at Walt Disney films. In 2007, having worked as an animation producer and art director, Sophia returned to her personal work: "And I'm now working as a digital hand painter and designer."

Sophia would like to combine her animation skills with a photo-realist aesthetic: "This is something I wish to explore much more and push forward my technique. I am still learning."

Sophia is keen to work with 3D software that gives photo-realistic results for humans, and there's a book of painted fairytales on the drawing board.

1 MOTHER NATURE
It's a sad fact, says Sophia, that humanity is its own worst enemy. "Humanity commits suicide by destroying its lungs, its health, its inheritance. Mother Nature is praying for us. She is praying for our sake, hoping one day we will finally succeed in living in harmony with our environment before it's too late."

2 THE LADYBIRD
"The challenge here," explains Sophia, "was to find a balance between the bird and the human." So, keeping focused on the flamingo-inspired creature, "I tried to bring a fantasy and romantic touch to the scene, while keep the pose elegant."

Created at ebookmall.com, download more at ImagineFX.com



© Shiflett Brothers Originals



© Narrative Ink

Walter O'Neal III
LOCATION: US
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EMAIL: w.onealiii@att.net
MEDIA USED: Acrylics



As a kid, Walter always had his nose in a comic book, immediately in love with anything that dealt with fantasy or the supernatural. Superheroes, vampires, aliens, demons: "Any subject that deals with beings endowed with fantastic abilities or dark powers," he laughs, "and I'm sold!"

When it comes to his own work, he says it's all about the detail: "I try to pack as much as I possibly can into a piece. I want you to forget that you're looking at a painting." Crucial to that is the rendering: "I shoot for a kind of stylised realism."

1 OL' SCRATCH
11x16in, acrylic on illustration board
Walter was commissioned by the fantasy sculpting duo The Shiflett Brothers for this portrait of their Ol' Scratch character. "Brandon and Jarrod Shiflett are such great guys," he says.

2 MEDUSA'S DAUGHTER
11x16in, pencil and gouache on paper
"This shows Medusa's Daughter (for Narrative Ink) making a futile attempt to tie down her wild hair using some makeshift straitjackets," says Walter.

The Gallery

Lucas Graciano

LOCATION: US
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EMAIL: lucasgraciano@yahoo.com
MEDIA USED: Oil



Lucas grew up with the works of great fantasy artists such as Frank Frazetta and Boris Vallejo. Straight from high school, he started his art career as a caricature artist at theme parks and special events.

Later, having attended the Watts Atelier of the Arts in Southern California, he started work on storyboarding and concept design in the games industry. Working mostly digitally at that time, Lucas wanted to attain the foundation skills that come with working in a traditional medium. He soon fell in love with the traditional process and has nearly completely switched over.

Lucas continued his training at the Atelier and was soon asked to teach. After developing his skills further, he moved into fantasy illustration and began freelancing while he taught. He landed his first illustration job on the very first set of the World of Warcraft card game, and has since worked for companies such as Sony, Wizards of the Coast and White Wolf.



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1 PSYCHOPOMP
16x12in, oil on hardboard
This piece was done for the book Drawing and Painting the Undead. As simple as it is, Lucas thinks it's one of his stronger pieces. "Its strong graphic read helped it get on the cover of the UK version of the book."

2 VALE MAIDENS
20x24in, oil on hardboard
"I like doing work for Sony," says Lucas, "because they give me a free reign." The only description on this assignment was 'six or seven female dryads guarding a tree.' "They will often hand me their low-res, in-game models as reference and say 'Make this look cool!' I think that's the kind of thing almost every artist wants to hear!"

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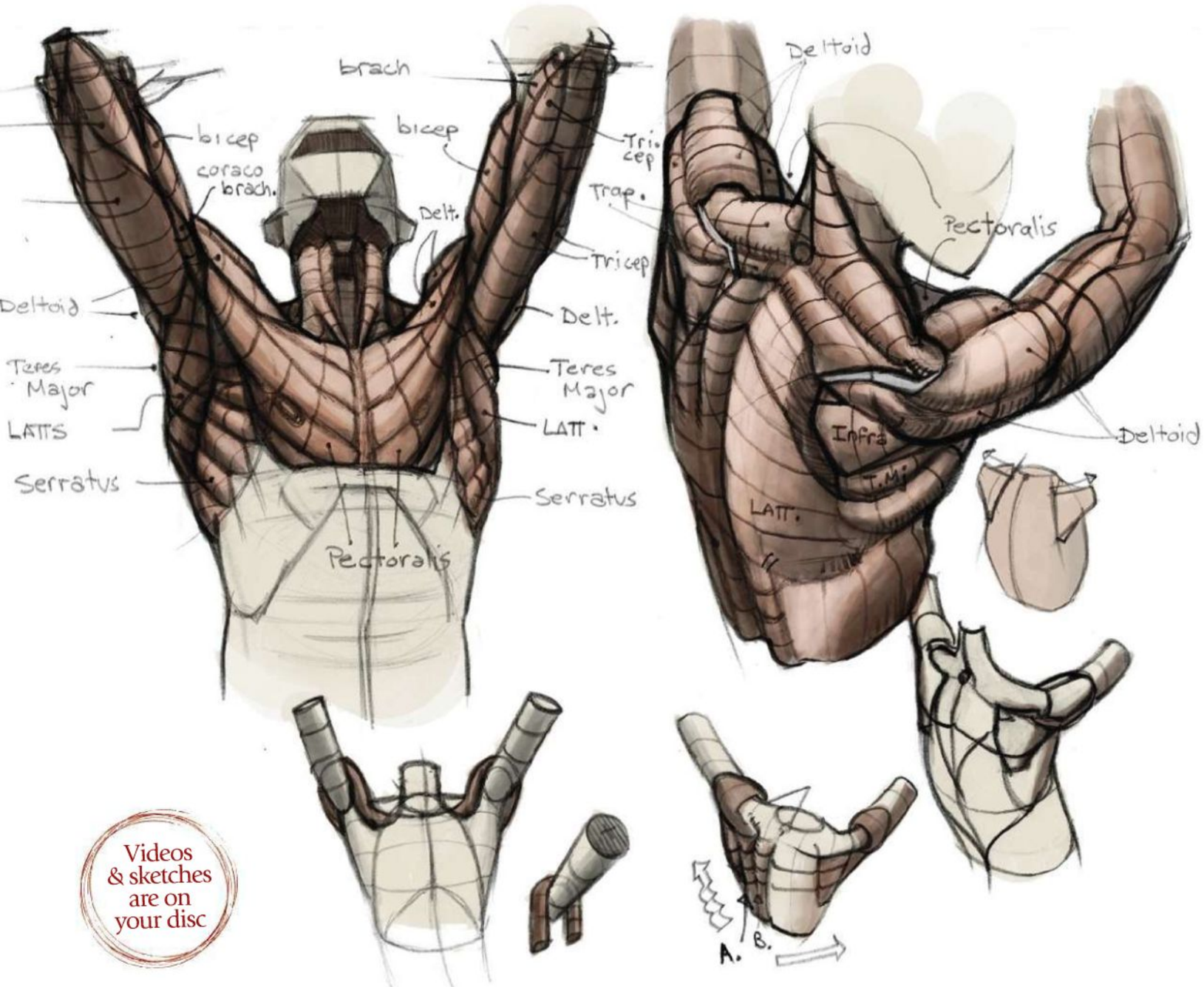
3 WORD OF PAIN
24x18in, oil on hardboard
"I like to keep my fantasy work more grounded," Lucas says. "I've never been a big fan of the bright flashy colours of magic, so I try and imply it in more subtle ways."

4 KALADIM WIZARD
12x16in, oil on hardboard
Lucas is a huge Tolkien fan. "Any chance I get to paint an epic battle scene with armoured dwarves, I'm very happy!" He's even got a small collection of armour that he "slaps onto some willing friends for photo reference".



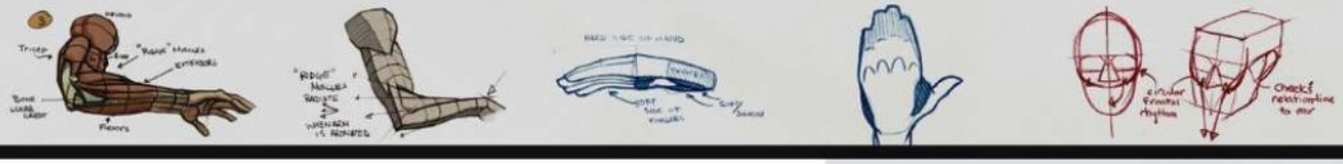
Human anatomy

A complete workshop on bringing your body drawings to life

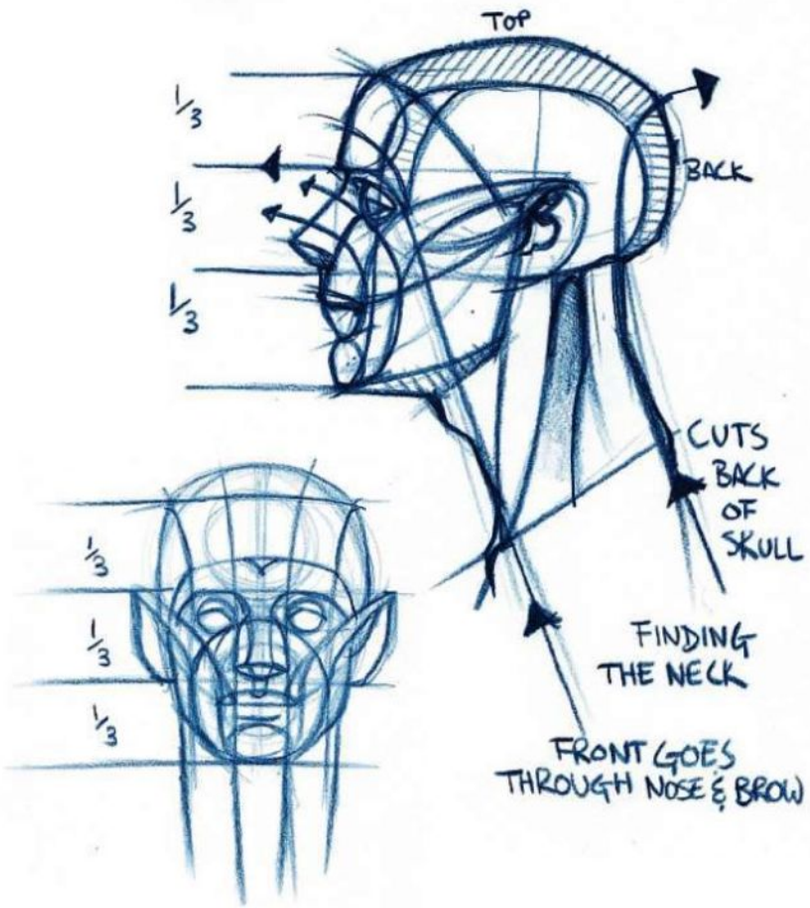


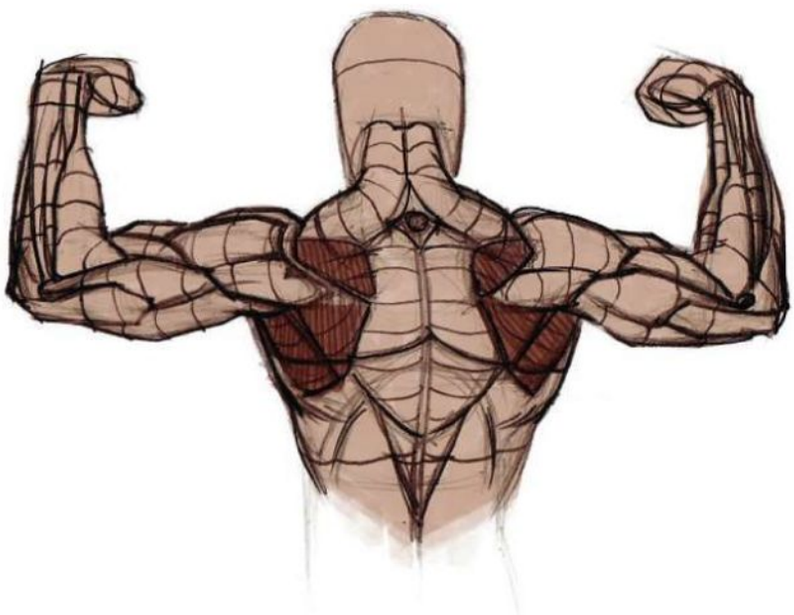
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> **The more knowledge you have, the easier it will be to reach clear-cut solutions for any drawing you make**
>
> Ron Lemen on drawing the body, page 16





Your human anatomy expert



Ron Lemen has worked in the entertainment and illustration industries for over 16 years. With his wife Vanessa, he runs the Studio 2nd Street art school and is in demand as an art instructor at drawing and painting classes across California.
www.studio2ndstreet.com

Workshops

Explore the body in eight parts



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Improve the way you draw figures with easy ways to establish the underlying structure of the body



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With the figure framework in place, it's time to set your focus on the core of the human body



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Many artists fear this part of the body, but apply the principles here and you'll see how easy it can be



54 The head
Discover how to break the skull and facial features into simple forms to get the proportions spot-on



PART 1

CREATING BASIC FORMS

Improve the way you draw figures by learning easy ways to establish the underlying structure of the human body

If you want to illustrate stories or book covers, design conceptually for games or draw storyboards, it's vital to grasp the foundations of representational art. With most stories you'll come across involving people, it's important to understand how to draw the human figure, both in a static pose and in action.

There are several techniques for drawing the human body, all leading to a similar goal: a three-dimensional, realistic figure. While it's not necessary to be an expert on anatomy to produce illustrations, the more knowledge you have, the easier it will be to solve problems and reach clear-cut solutions for any drawing you make.

What you lack in the foundations of your knowledge will show up in your work – in other words, the lack of understanding of certain key principles will be all too apparent in your finished piece. An artist's style can be reflective of their lack of understanding just as much as it can be a showcase for the total sum of their knowledge. Avoid that trap.

Artist PROFILE



Ron Lemen
COUNTRY: US

See more of Ron's work at his website
www.studio2ndstreet.com

On the disc
Find a video and sketches in the Drawing Intro folder inside Human Anatomy

Figuring it out: two ways to draw

There are two distinct approaches to figure drawing: observational and formulaic. It pays to master both...

Learning to draw the human form can be a daunting prospect for any fledgling artist. Therefore, it's important to know what methods are available to you. The two approaches to figure drawing that I feel to be distinct are the observational approach and the formulaic approach.

Observational drawing has its origins in the sight-size methodology, which trains the eye to view a subject with accuracy, placing the object and the drawing side by side for comparative analysis. Plumb lines, levels, a fixed point and a measuring line are used to help the artist in understanding dimensional and spatial measuring.

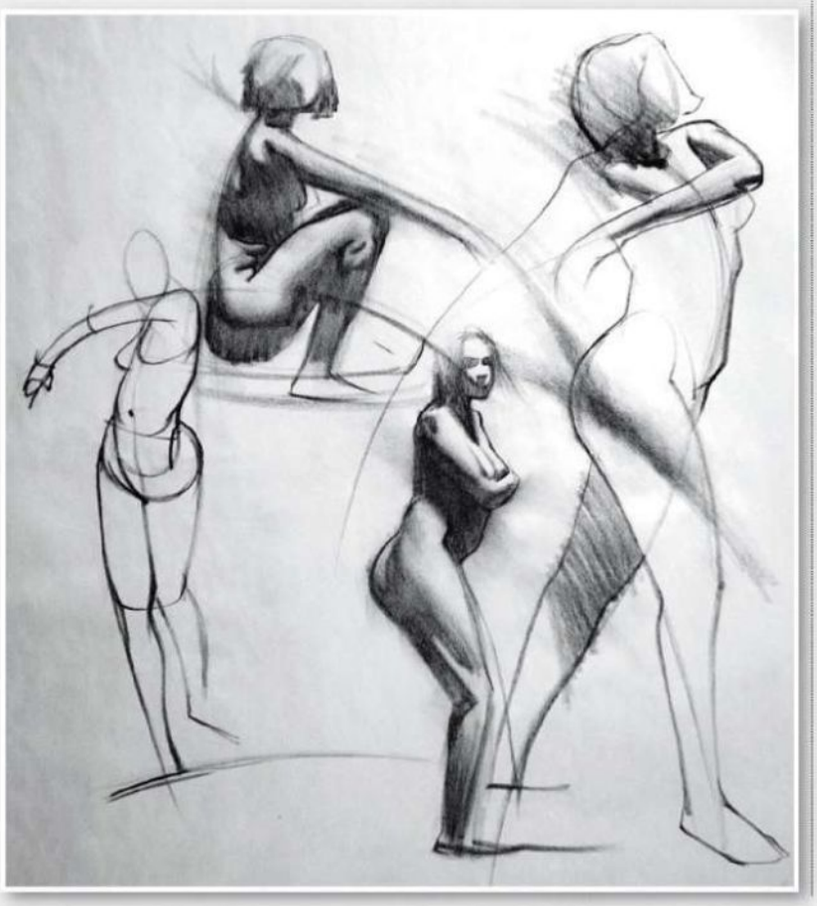
Observational drawing is a complex process that requires a great deal of reference material to accompany the words to be fully explained. In this part of our anatomy workshop, I'm going to take a detailed look at two of my favoured methods of formulaic drawing.

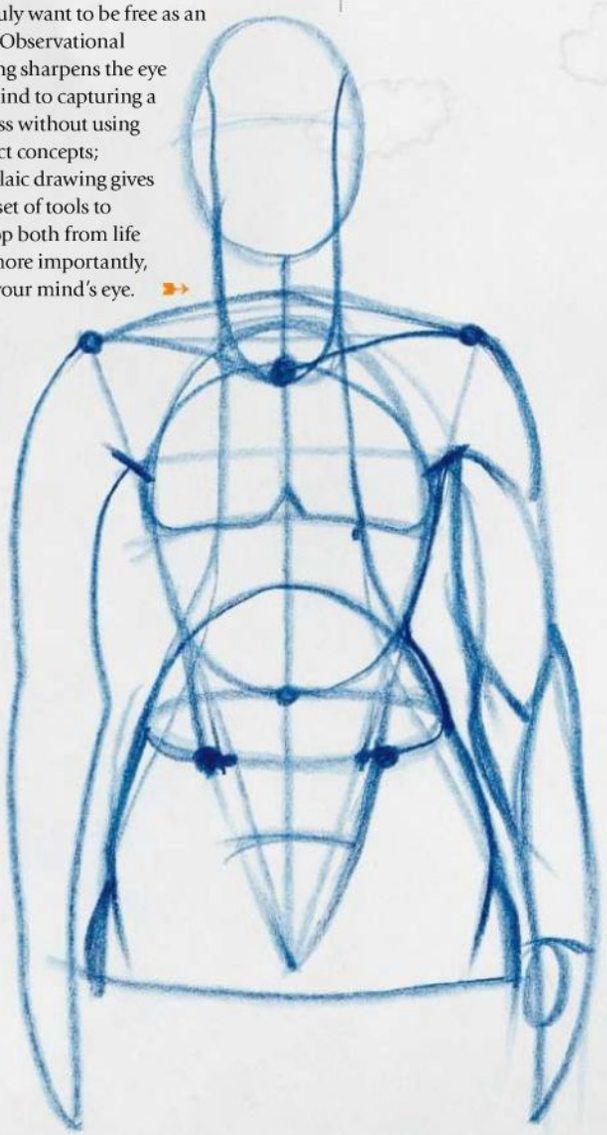
Formulaic figure drawing uses abstract rhythms or interlocking shapes – basically design concepts – to build on. Once these formulas are memorised by drawing from life, you have a set of tools to recall, enabling you to design from your imagination if you wish.

It's important to have a solid understanding of both approaches if you truly want to be free as an artist. Observational drawing sharpens the eye and mind to capturing a likeness without using abstract concepts; formulaic drawing gives you a set of tools to develop both from life and, more importantly, from your mind's eye.



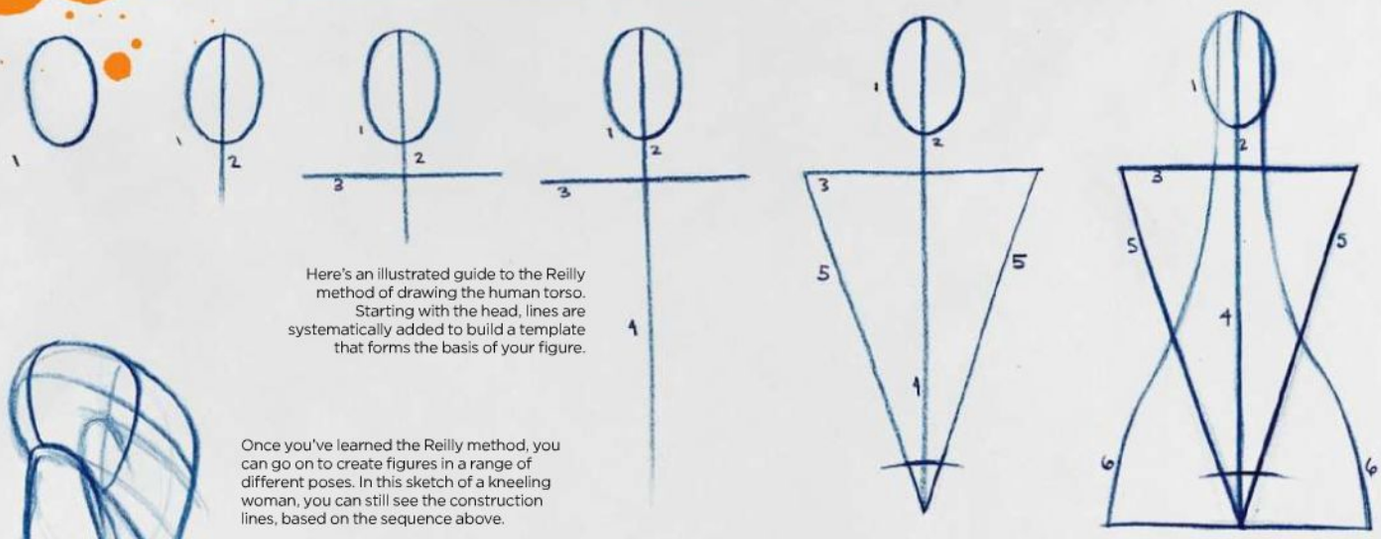
Observational drawing in practice, using a pencil to measure the body's dimensions.





Formulaic figure drawing systems involve using abstract rhythms or, as shown above, interlocking shapes, to construct the human body. Those shapes can then be built upon and fleshed out for a full human figure.

REILLY'S SIX LINES TO THE TORSO



Here's an illustrated guide to the Reilly method of drawing the human torso. Starting with the head, lines are systematically added to build a template that forms the basis of your figure.



Once you've learned the Reilly method, you can go on to create figures in a range of different poses. In this sketch of a kneeling woman, you can still see the construction lines, based on the sequence above.

Exploring the Reilly method for figures

In this drawing system, you build a framework of overlapping lines to create the basis of your figure

There are as many ways to construct a human figure as there are artists, but two systems in particular form the basis of many artists' working practices. Over the page, you'll explore the Industrial Design method; but first, let's look at the Reilly method.

Frank Reilly was an illustrator and instructor in the early- and mid-20th century. He created a system of teaching that enabled students to quickly and easily digest the problems of drawing and painting, giving abstract concepts labels and definable schematics, and building a noteworthy step-by-step course of action to create figure drawings. His system came from several sources, starting with Dean Cornwell and Frank Brangwyn, as well as George Bridgeman (one of Reilly's teachers) and Frank Vincent DuMond.

Frank Reilly's system became a fashionable method in most of the American art schools of his day. His figure drawing approach is a linear one, starting with the structure of the figure before advancing on to the anatomy, then shading and finally detailing. His approach started with the core of the figure: the torso.

Capturing the action of the pose is probably the most important concern. The action begins with the head and radiates through the spine into the limbs. To start the drawing, you need to make six lines: the head; the centre of the head and neck; the shoulder line; the spine; the line relating the shoulders to the base of the pelvis; and, finally, the line showing the neck and hip relationship. These lines design and define the core of the pose.

"Frank Reilly's figure drawing approach is a linear one, starting with the structure of the figure and advancing on to the anatomy"

Arms and legs

Once the core of the pose is established, the arms and legs are attached to complete the action. This simple construction creates the structure of the pose. The

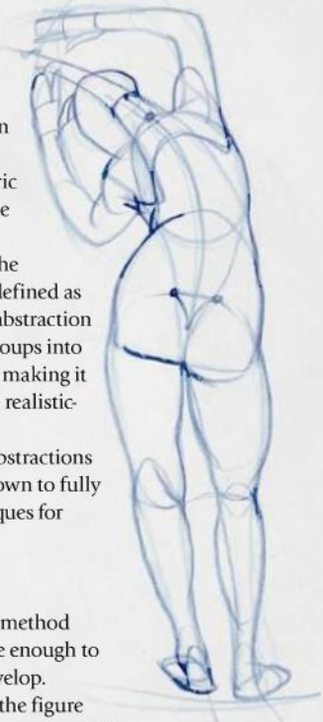


Capturing the action of the character's pose should be foremost in your mind. The action begins with the head and radiates from there.

anatomy is then depicted within the structure you've created.

Muscles are woven like a fabric to the skeleton, connected to the bones with tendons – rope-like attachments. The point where the tendon attaches to the bone is defined as the insertion point. The figure abstraction helps place the major muscle groups into an organised and fluid pattern, making it quite simple to invent complex, realistic-looking figures.

The head has its own set of abstractions that requires a workshop of its own to fully understand. We look at techniques for drawing the head on page 54.



The body's anatomy is designed into the structure you create, weaving in muscles and tendons and gradually building up details.

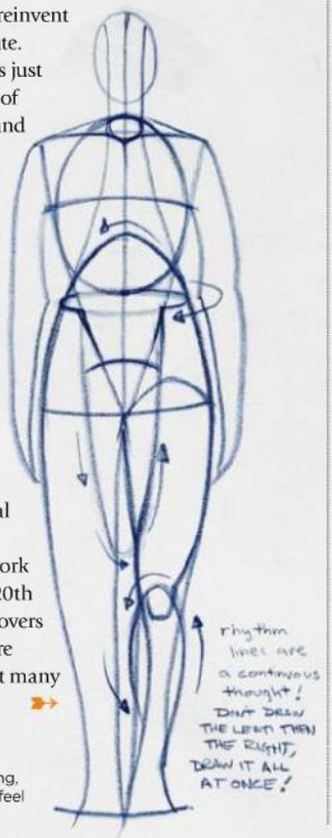
Beyond Reilly

The fundamentals of the Reilly method are easy to grasp, but it's flexible enough to adapt as your drawing skills develop. Once you properly understand the figure abstraction underpinning the system, you'll find that you'll constantly change and rearrange lines to suit every pose and every situation. The standard set of lines you start with are charts for learning – they're just one set of possibilities, a stock vocabulary that will constantly flex, grow and reinvent itself with each new image you create.

> **"It's important to practise as much as possible, so that you can perform with clarity"**

I cannot stress enough that this is just a system to learn from. All systems of drawing are designed for teaching and should be left behind as soon as they're mastered, like stabilisers on a bicycle. Too many carefully followed rules can lead to pictorial sterility. It's very important that you train and practise as much as possible until the rules become background noise, so that when we perform, we can do so with total clarity and focus on the more important aspects of making a picture – the story content and the pictorial intent.

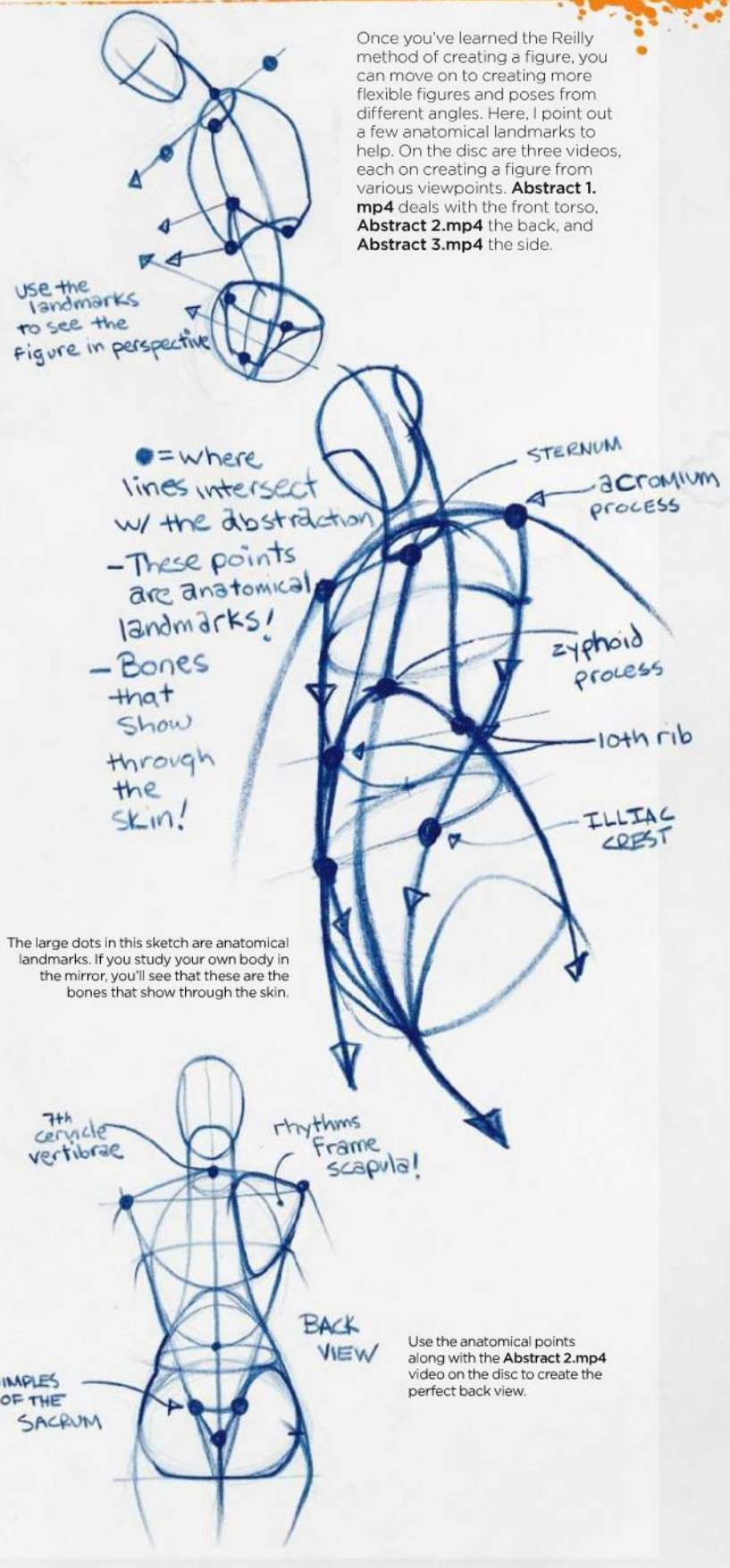
If you want to do some additional research on the Reilly method, I recommend that you look up the work of Andrew Loomis, a famous mid-20th century American illustrator who covers some of these principles in his figure drawing manuals, and offers a great many useful techniques besides.



As you construct your figure, try to use long, flowing lines so that the drawing starts to feel alive, even at this early stage.

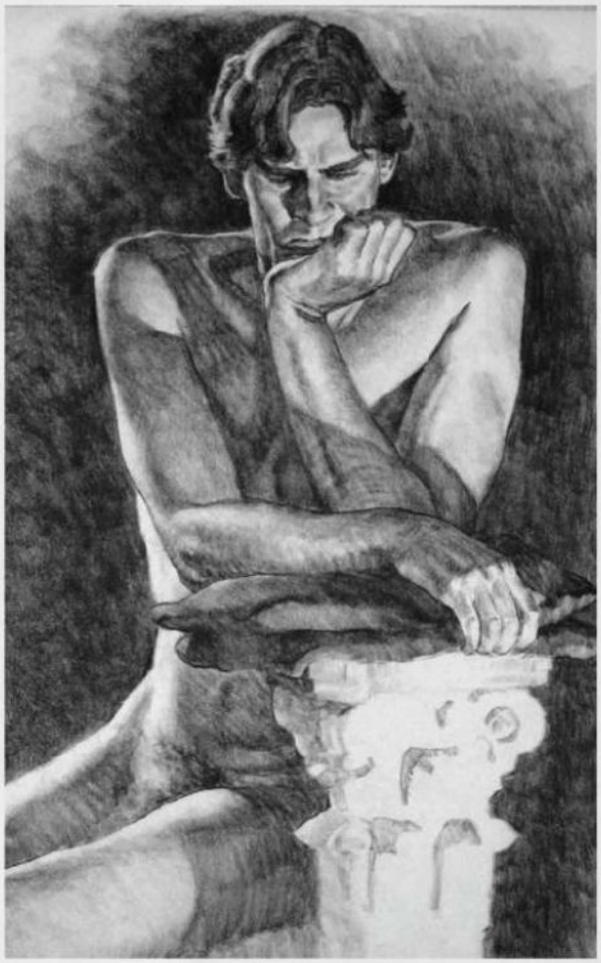
USE LANDMARKS TO FIND YOUR WAY AROUND THE HUMAN BODY

Once you've learned the Reilly method of creating a figure, you can move on to creating more flexible figures and poses from different angles. Here, I point out a few anatomical landmarks to help. On the disc are three videos, each on creating a figure from various viewpoints. **Abstract 1.mp4** deals with the front torso, **Abstract 2.mp4** the back, and **Abstract 3.mp4** the side.



The large dots in this sketch are anatomical landmarks. If you study your own body in the mirror, you'll see that these are the bones that show through the skin.

Use the anatomical points along with the **Abstract 2.mp4** video on the disc to create the perfect back view.



Here the figure is rendered with hatch lines, creating an immediate illusion of form. The lines crossing over the form are crossing in the short stroke direction.

Exploring the Industrial Design drawing method

Use basic geometric shapes to make your figures feel solid and three-dimensional

Here, I'm going to look at a second abstract approach to figure drawing: the Industrial Design method. Its origins are age-old, but it was perfected at the Art Center of Pasadena in the 1950s.

I find Industrial Design the most practical technique to use when creating the figure for any purpose. It makes it easy to control the pose and achieve convincing foreshortening painlessly.

First, you need to sort the head, neck and shoulders. These provide a starting point to build the figure gesture from. Viewed from the front, the head is an oval shape, while in profile or side view, it's a bloated triangular form. The corners of the triangle depict the tilt of the head.

The panel below shows some examples of cylinder figures in gesture poses, which is what you have to find next. The gesture of the pose is a fluid, flowing line: it's the big sweeping movement that's made between the upper and the lower halves of the body.



This cartoon character is fully realised using the shape design approach from life drawing. The technique can be used for any figure.

It should be graceful, and is ideally established in one or two curvy lines.

Add to your first line a second line, which describes the width of the pose. This helps establish the overall volume of the figure – heavy or lean. These two lines should mirror each other, moving in relationship to one another. Line three is the centre line of the pose, attached to the pit of the neck.

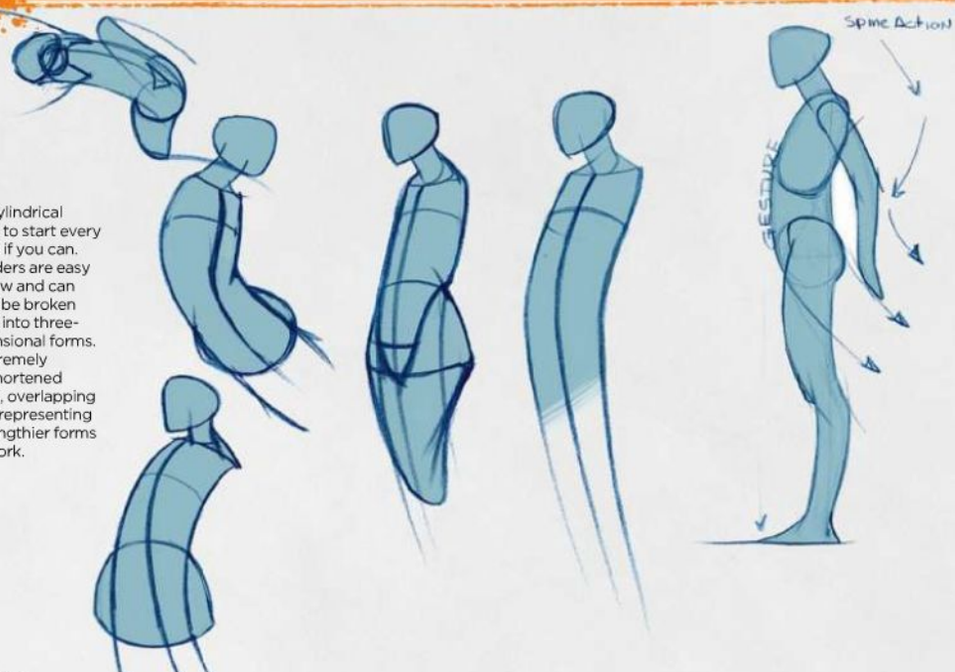
With a centre line drawn, you can now draw an ellipse or oval. This describes the depth of the form. The centre line gives you another point you can now convincingly attach the oval to, turning your three lines into an active cylindrical form.

Cylinders are easier to draw than a cube form, as you need to know perspective to make cubes look convincing. Cylinders, if drawn correctly in perspective, give the viewer a strong sense of position in space.

The shoulders are the top point of the cylinder, the pelvis its bottom. The pelvis varies in shape depending on what character you're drawing. It can be drawn as a soft, sphere-like shape – think of it as a marshmallow – or can be more defined.

Your subject's gender determines the pelvis shape. Female pelvises are more bell- or skirt-shaped; male pelvises are more box-shaped. The front of the pelvis terminates in a bullet-like shape. This is drawn inside the body cylinder shape,

DRAWING CYLINDER FIGURES IN GESTURE POSES



Use cylindrical forms to start every figure if you can. Cylinders are easy to draw and can easily be broken down into three-dimensional forms. In extremely foreshortened poses, overlapping ovals representing the lengthier forms will work.



You can map shadows to the shapes you design on the scaffolding of the figure, with the patterns falling appropriately over the shapes you've drawn rather than drawing exactly what you see. The illusion of the drawing can suffer if you stick too rigidly to what you see without really thinking about how the forms are functioning in 3D space.

crests, the navel and the armpits. If your figure's back is visible, the scapulae, the dimples of the sacrum, the obliques and the base of the pelvis are also helpful to use as landmarks.

If the figure is twisting or turning, you can easily depict this movement in the cylinder by pinching one side, or by creating an accordion-like relationship between the ribcage and pelvis masses.

The obliques play a role in shaping the cylinder: they are the third bulge on the compressed side of the cylinder. These bulges are described using S-curved lines (see the panel to the right), the only line type in drawing that can generate perspective in its own waviness. The S-curve starts against the outside of one shape, then swings over and completes its circuit below on the next succeeding shape. Each S-curve generates a more convincing illusion of overlapping forms.

You should switch often between gesture and structure to strike a balance

"If a figure is twisting or turning, you can easily depict this movement in the cylinder by pinching one side"

cutting in on either side to show the hip bones, the iliac crests.

Now draw an egg shape to indicate the ribcage, attaching it to the shoulder line and only breaching the cylinder form if the body is compressed or twisting. The rest of the torso is built up using ellipses or traversing lines across the centre line, to square up the two halves of the torso and pelvis.

The important landmarks to indicate are the nipples, the tenth ribs, the iliac

of form and movement, hopefully in a similar dynamic to Michelangelo or Rubens – but with a modern flair, like that of Claire Wendling or Bruce Timm.

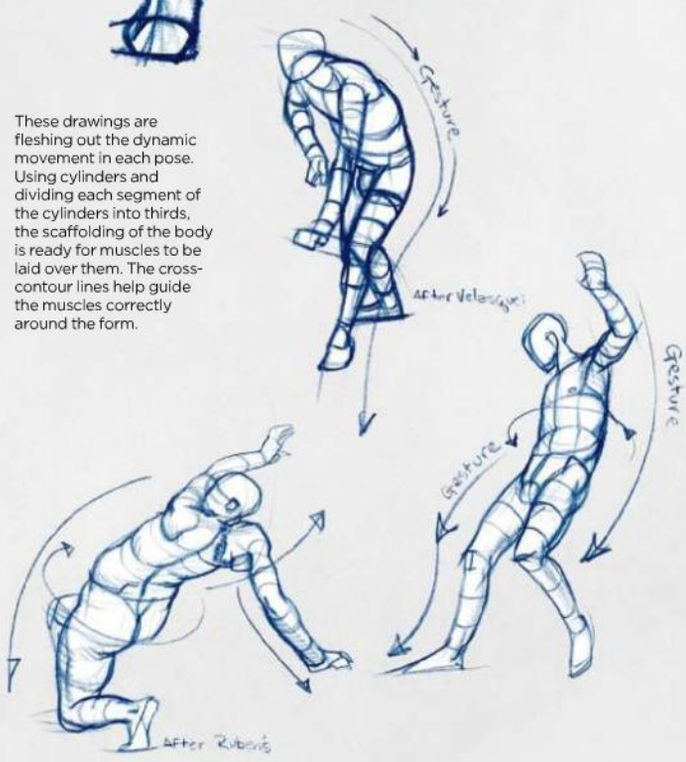
Once the structure is defined, move into gesture again, drawing the cylinders of the arms and the legs. When your limbs are drawn in, move back into structure and define the muscles, then gesture again to describe the movement of the shadow patterns over the muscles, then structure to tighten them up.



THE FIGURE AS AN S-SHAPE

Draw the ribcage as if looking up at it, with lines arching upward. Draw the pelvis with lines arching down. This keeps the forms tilted correctly to the viewer from straight-on.





These drawings are fleshing out the dynamic movement in each pose. Using cylinders and dividing each segment of the cylinders into thirds, the scaffolding of the body is ready for muscles to be laid over them. The cross-contour lines help guide the muscles correctly around the form.

PART 2

DRAWING THE TORSO

With the figure framework in place, it's time to focus on the core of the human body



When you draw a torso, you should take into account not only the muscle tone, but the age of the subject too.

The torso is the core of the body: the complex centre from which all our dangly parts originate. Our physical actions also originate from this core – therefore, you typically start with the torso in figure drawing to work out the dynamics of your pose.

The head is the ruler that you measure the body from; the body is the primary essence of the pose. Both are important to draw from the start, but the head can stiffen up quickly with no reference to the body. If you design the body first, the head has more chance of complementing the action of the body.

First, you need to find the action of the pose. This step is called the gesture. Using the Industrial Design method, as described on page 20, you can find this action in three lines: the gesture, the width and the depth. Once the gesture or action of the pose has been established, the limbs are then attached to complement the twist, turn or swivel of the torso. With the head attached, you can measure off the height and width of the torso more appropriately, or adjust the drawing to a more correct scale throughout the pose.

Next, draw a centre line through the middle of the torso. (Simply put, the centre line of the back is the spine.) The front of the body is divided through the centre of the chest, or the sternum, and continues through the line that splits the abdominal muscles down to the pelvis.

The centre line is very important to draw. It finds the middle of the visible surface to match and align the forms on either side of it, and it's also an anchor and apex for matching rhythmical lines

Artist PROFILE



Ron Lemen
COUNTRY: US

See more of Ron's work at his website
www.studio2ndstreet.com

On the disc
Find reference sketches by Ron in the Torso folder inside Human Anatomy

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from either side of the body. Neglecting to draw the centre line in your structure is like forgetting to bring the manager along to the big game.

If you don't use boxes to design the pelvis and the ribcage, the next step is to find the three-quarter line of the figure, or where the figure turns from the frontal planes to the side of the body. In many poses, this landmark can be as important as the centre line: it's a major breaking point in form, critical to both the perspective and the alignment of the limbs from the left side to the right side of the figure.

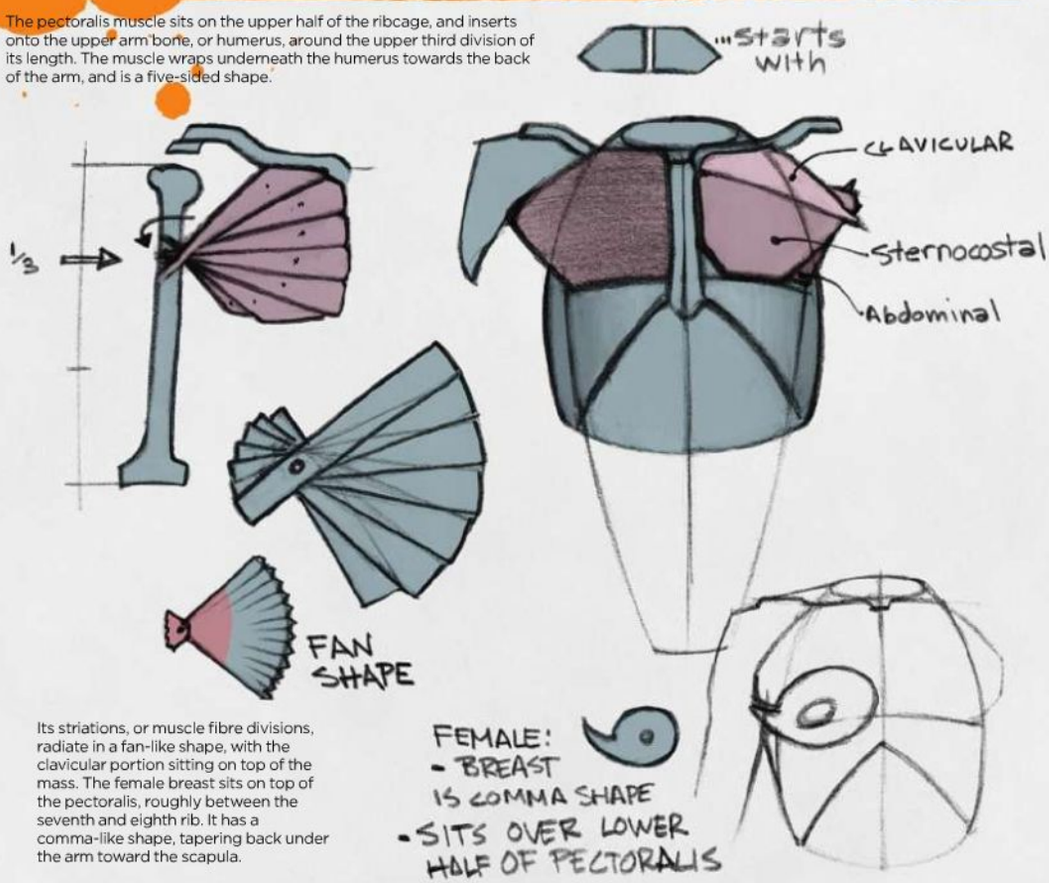
Torso muscles

The front of the body is made up of six major visible muscle groups: the pectoralis muscles, the abdominal muscles, the obliques, the serratus muscles, the trapezius muscles and the lattisimus muscles, which you can see if the arms are lifted. Unfortunately, two of these muscle groups have multiple heads to them, but are well organised, so rendering them is just a matter of finding the larger shape that keeps the smaller ones organised and harmonised.

The body wedges down from the acromium processes – the bumps at the shoulders – and tapers to the base of the crotch. The wedge forms the true front plane of the body; the masses on either side of the wedge taper at a sharp angle, and become a part of the side planes of the figure. The wedge form passes through

GETTING THE PECTORALIS MUSCLE RIGHT

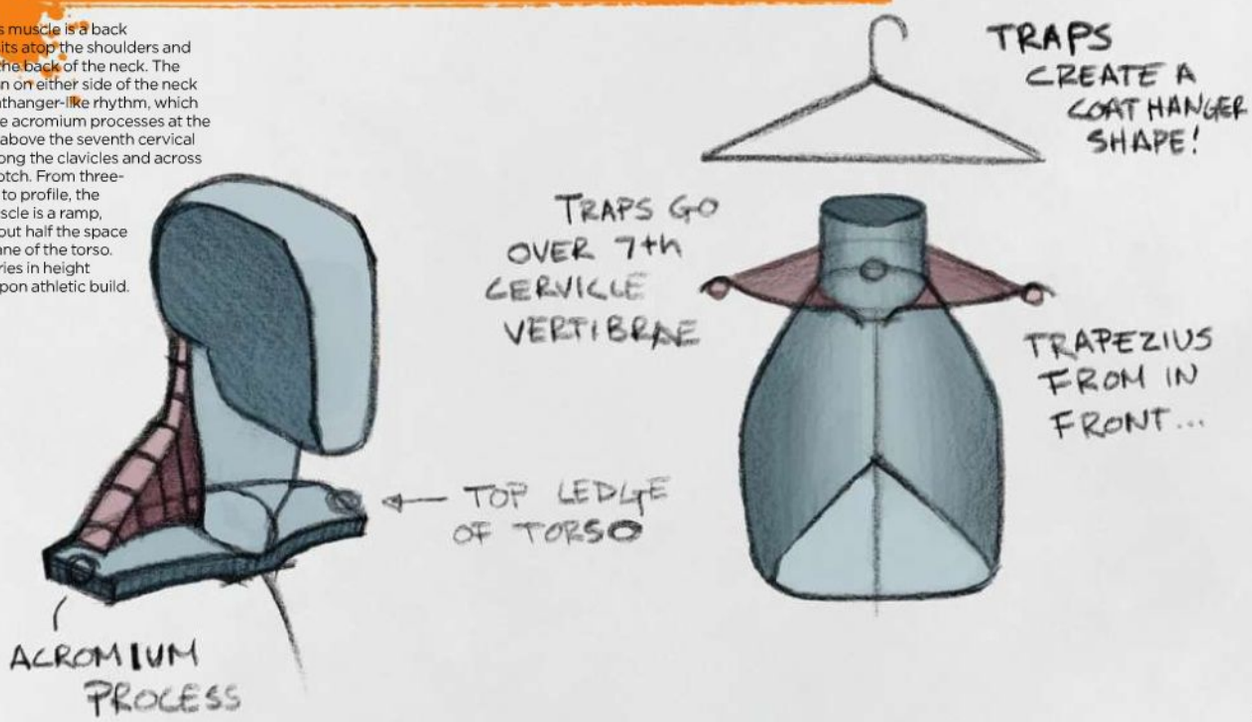
The pectoralis muscle sits on the upper half of the ribcage, and inserts onto the upper arm bone, or humerus, around the upper third division of its length. The muscle wraps underneath the humerus towards the back of the arm, and is a five-sided shape.



Its striations, or muscle fibre divisions, radiate in a fan-like shape, with the clavicular portion sitting on top of the mass. The female breast sits on top of the pectoralis, roughly between the seventh and eighth rib. It has a comma-like shape, tapering back under the arm toward the scapula.

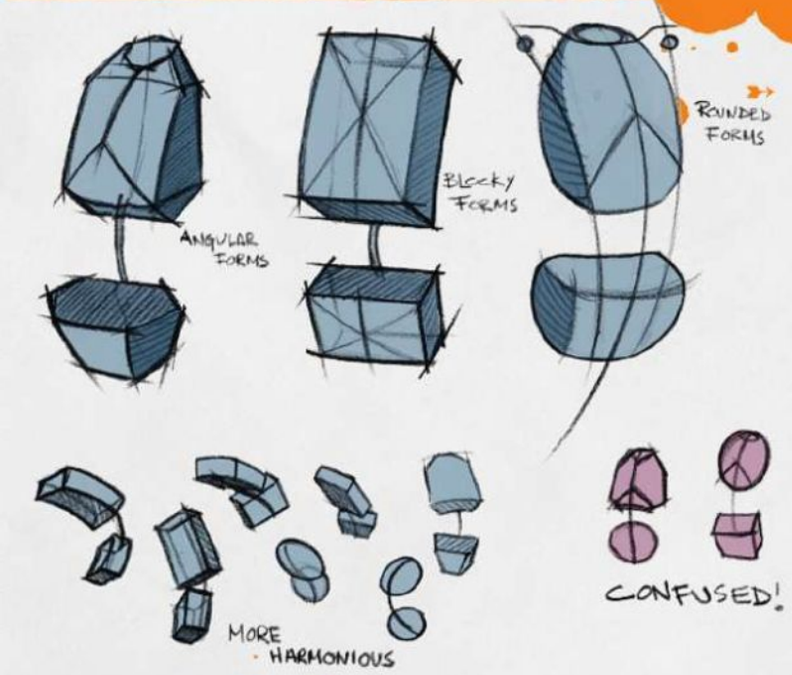
THE COATHANGER METHOD

The trapezius muscle is a back muscle, but sits atop the shoulders and connects to the back of the neck. The visible portion on either side of the neck creates a coathanger-like rhythm, which goes from the acromium processes at the shoulders to above the seventh cervical vertebrae, along the clavicles and across the sternal notch. From three-quarter view to profile, the trapezius muscle is a ramp, taking up about half the space of the top plane of the torso. The ramp varies in height depending upon athletic build.



“Neglecting to draw in the centre line is like forgetting to bring the manager along to the big game”

GETTING THE TORSO STARTED



Here are a few ways to start the torso. The first is angular, the second box-like, the third spherical. There is no right or wrong set of shapes, but there may be confusion in the structural design if there are too many shapes to start with. A more harmonious way is to maintain a shape design consistency throughout. These shapes are flexible, bending on the spinal axis.

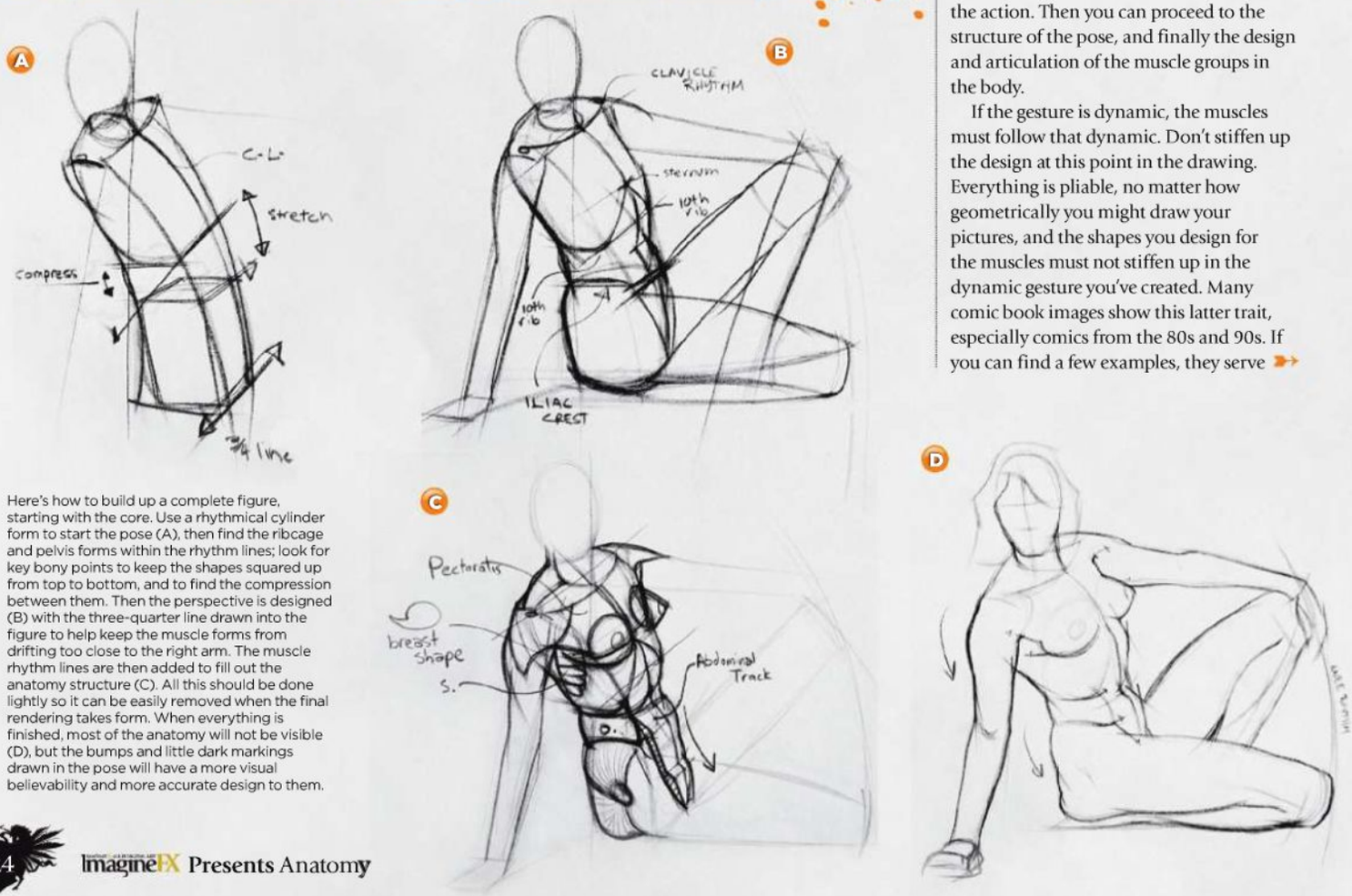
the obliques, or what we usually call the spare tyre muscles. These muscles are the soft mass between the ribcage and the pelvis. They taper in narrowly at the ribcage and widen at the hips, resting atop the iliac crest. This wedge can be linked to the two lines that form the neck in a rhythmical relationship that helps keep the oblique muscles from becoming too unusual in their shape design. The obliques form true side walls – perpendicular planes to the front and back planes of the body – and blend with the angular sides of the ribcage.

The torso is extremely pliable between the ribcage and pelvis. The further you push the rhythm between these two shapes, the more convincing the action design will feel. The muscles on the front of the body are very pliable and can be stretched and twisted as much as needed to help enhance the gesture of the pose.

It's very important to start the pose with the gesture first, to seize the moment and the action. Then you can proceed to the structure of the pose, and finally the design and articulation of the muscle groups in the body.

If the gesture is dynamic, the muscles must follow that dynamic. Don't stiffen up the design at this point in the drawing. Everything is pliable, no matter how geometrically you might draw your pictures, and the shapes you design for the muscles must not stiffen up in the dynamic gesture you've created. Many comic book images show this latter trait, especially comics from the 80s and 90s. If you can find a few examples, they serve

DRAWING THE HUMAN FIGURE: A FOUR-STEP GUIDE



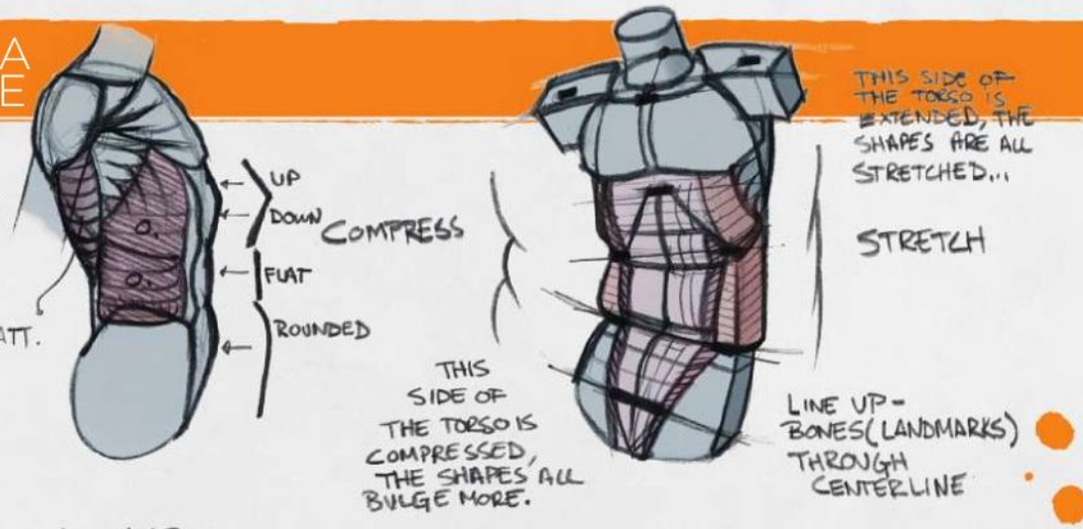
Here's how to build up a complete figure, starting with the core. Use a rhythmical cylinder form to start the pose (A), then find the ribcage and pelvis forms within the rhythm lines; look for key bony points to keep the shapes squared up from top to bottom, and to find the compression between them. Then the perspective is designed (B) with the three-quarter line drawn into the figure to help keep the muscle forms from drifting too close to the right arm. The muscle rhythm lines are then added to fill out the anatomy structure (C). All this should be done lightly so it can be easily removed when the final rendering takes form. When everything is finished, most of the anatomy will not be visible (D), but the bumps and little dark markings drawn in the pose will have a more visual believability and more accurate design to them.

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A PINCH HERE, A STRETCH THERE

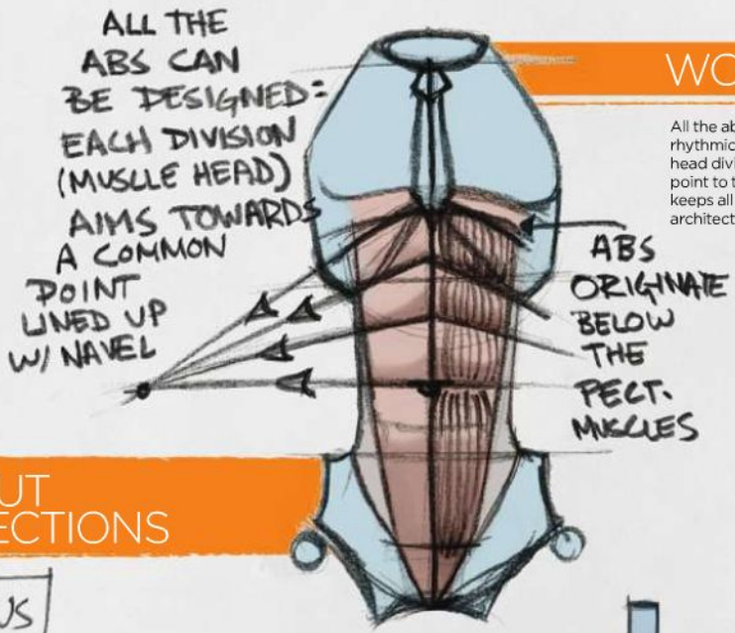
Seen from profile, the abdominal muscles each have a different type of contour. The top two muscles are angular: the top heads predominantly face up over the ribcage and the second set of heads face downward. The middle heads face flat forward and the lower abs bulge at the top in a rounded taper towards the base of the pelvis. The muscles have this structural design to help when the body leans forward.

The figure on the far right has been drawn using construction forms to keep the anatomy geometric, planar and simple. The right side is pinching or bending in; as a result, the shapes on the right profile all take on a bulging appearance from compression. The left side of the figure is stretched out, and the shapes relate to this.

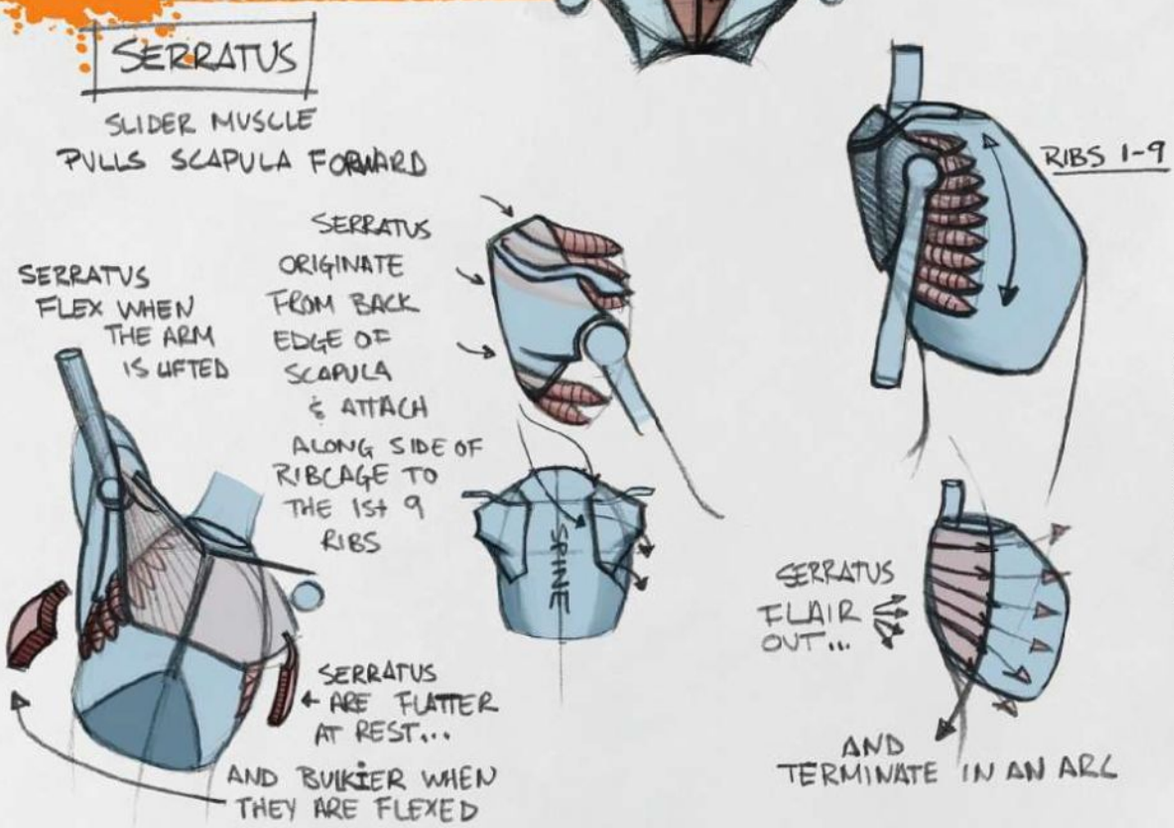


WORKING THE SIX-PACK

All the abs stacked up on each other have a rhythmical relationship to one another, as all the head divisions can be connected together at a point to the side of the body. This relationship keeps all the muscle heads organised in the architecture of the bones of the torso.



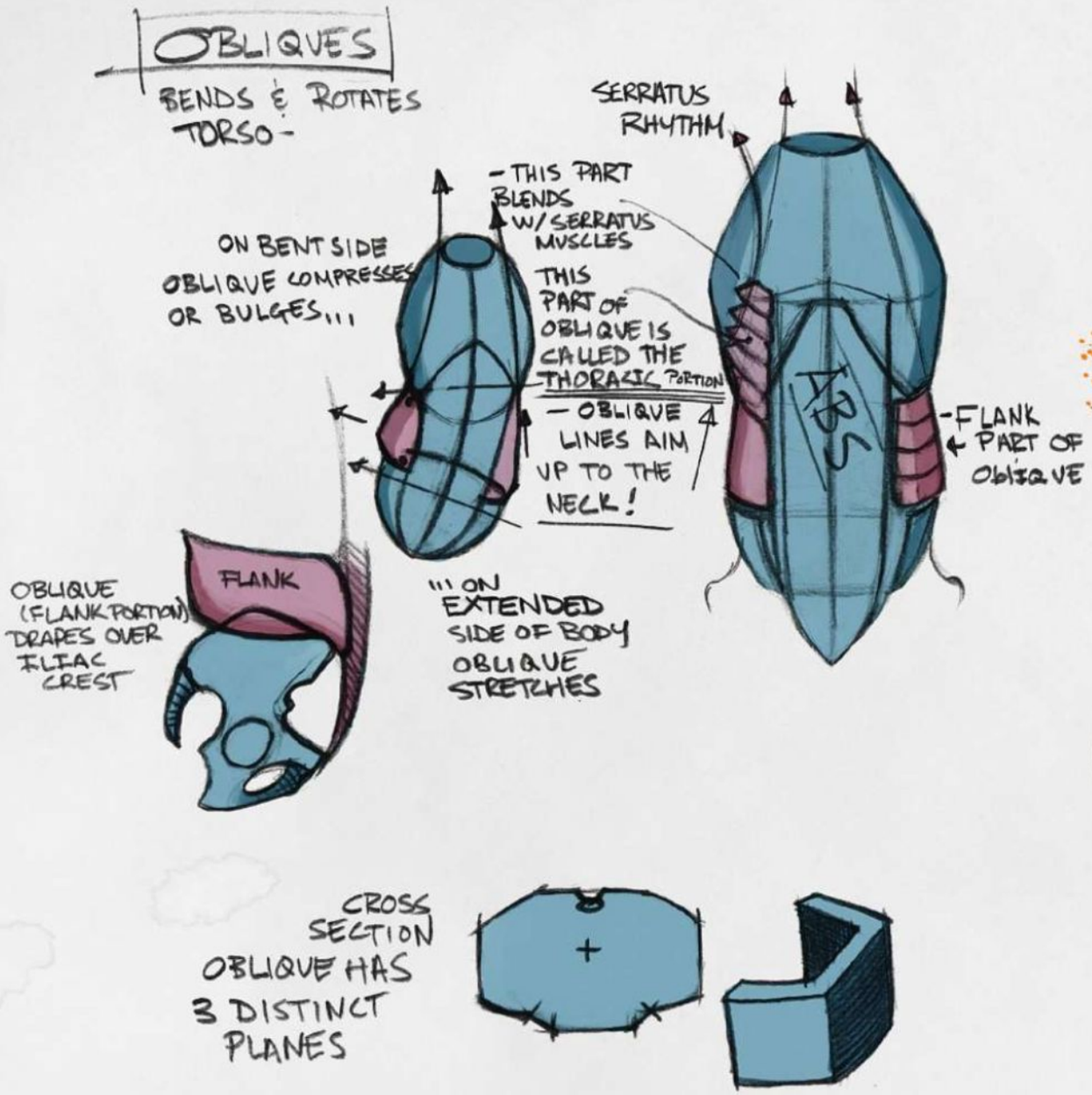
SORTING OUT THE CONNECTIONS



The serratus muscles connect the scapula to the ribcage from beneath the scapula. The muscle heads originate along the inside edge of the scapulae on the back, closest to the spine, and terminate halfway along the first nine ribs. These muscles insert snugly into the obliques, and radiate in an arc on the side of the body, with all the muscles fanning out from top to bottom.

HOW THE TORSO ROTATES

The obliques are the big muscles that bend and rotate the torso of the body. The flank portion of the muscle sits between the ribcage and pelvis on the sides of the body. The flank drapes over the iliac crest, giving the pelvis what looks like a downturn on the tops, rather than the upturn of the bones' design. They have three distinct visible planes from the side of the torso. The rest of the oblique travels up the ribcage and laces together with the serratus muscles, and blends to the abdominal appaneurosis.





MAKING IT FIT

The drawing is never correct until the whole has been established. This means that to understand the relationships of the parts, you must see them all assembled together. Don't become critical of one drawn line; try to draw the entire pose quickly, then assess as a whole what can be fixed or altered to create a stronger, more convincing pose.



as a good lesson in what not to do when anatomy meets gesture.

As always with anatomy, no matter how much you know, there's always more to learn. Remember: the key is to practise, practise and practise some more – and to have fun doing it.

"The muscles on the front of the body are very pliable and can be stretched and twisted as much as needed to help enhance the pose"

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PART 3

DRAWING THE LEGS

Master your depiction of the limbs that drive the rest of the body



Artist PROFILE



Ron Lemen
COUNTRY: US

See more of Ron's work at his website
www.studio2ndstreet.com

On the disc
Find reference sketches by Ron in the Legs folder inside Human Anatomy

The legs provide support for the body and power much of its movement. Like the arm, the leg has groups of muscles that oppose one another in their action. For example, the quadriceps at the front of the body are used to extend the leg, with the bicep femoris, semi membranosis and tendonosis acting as flexors. Both the arms and the legs start wide at the torso and taper to about half that width at the wrists and ankles. The biggest structural difference is the organisation of muscles around the kneecap, which differs to the ridge or rotator muscles in the elbow.

Now, without getting too caught up in the names, let's get down to discussing the shapes and rhythms in a leg, breaking the drawing down into easy steps.

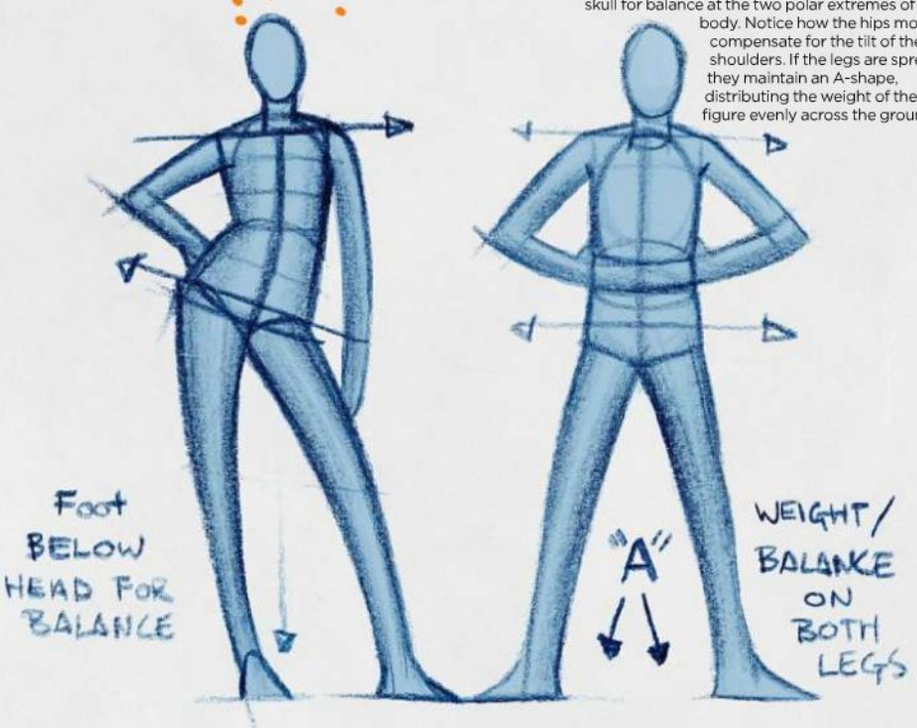
You should start with a simple gesture: a line connected to the hips will do. The hips are the pivot point for the legs, and act as an axle. Remember that both sides of the hips are fused together, unlike the shoulders, which float independently of each other. The tilt of the hips opposes the angle of the shoulders, meaning that the action at the top of the body is counter-balanced by the position of the lower body, which creates stability. The hips can be drawn as one of several different masses, depending on your preferred drawing methodology, but they all serve the same function: volume and construction.

Leg bones and muscles

The pelvis is a narrow shape funnelling inward towards its base. The wide point of the hips is created by the femur and the hip muscles, which are mostly responsible for connecting the leg to the body, and fill in the space between the pelvis and femur. These hip muscles flair out in an A shape and act in a broadly similar way to the

THE RELATIONSHIP BETWEEN HIPS AND SHOULDERS IN POSES

In a typical standing pose, unless the legs are spread, one foot always sits directly below the skull for balance at the two polar extremes of the body. Notice how the hips move to compensate for the tilt of the shoulders. If the legs are spread, they maintain an A-shape, distributing the weight of the figure evenly across the ground.

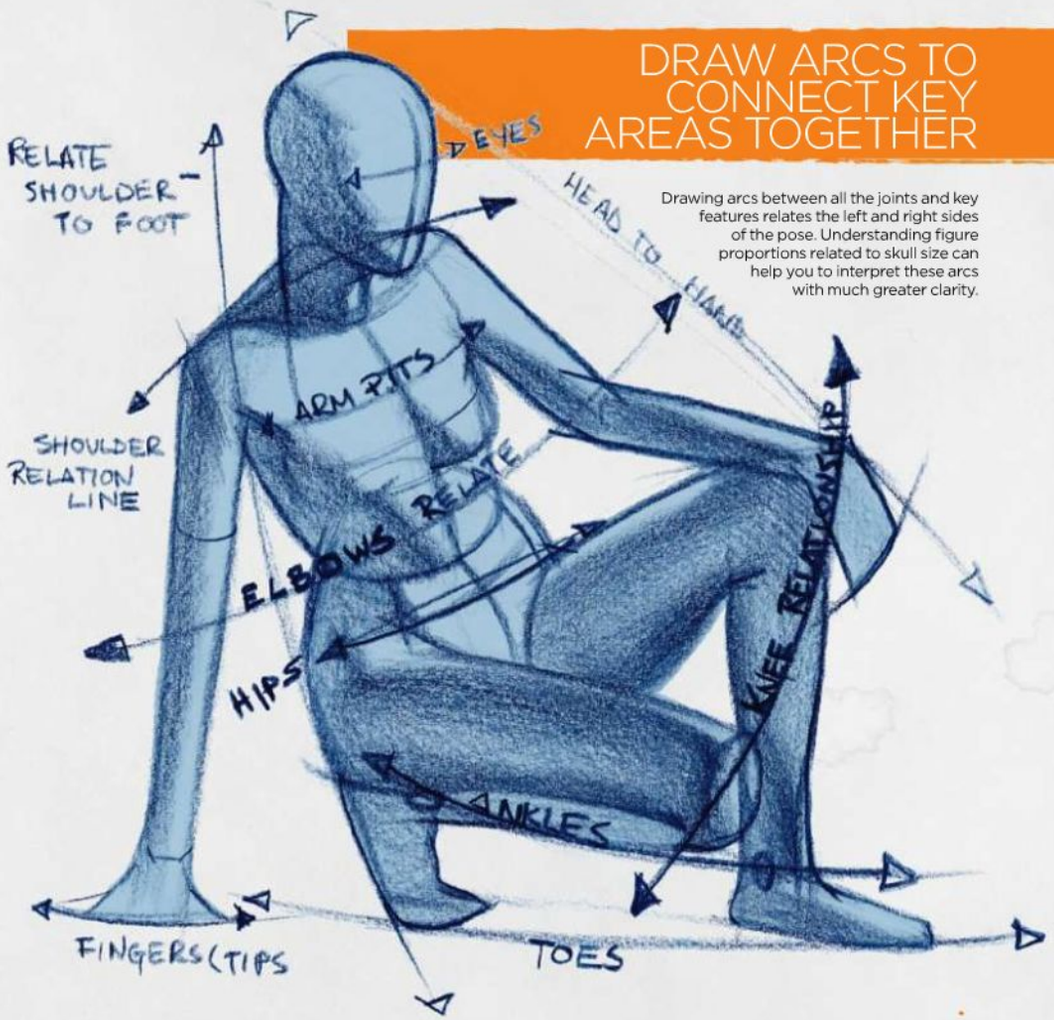


“Remember that both sides of the hips are fused together, unlike the shoulders, which float independently of each other”

shoulder muscles, which we look at in more detail on page 38.

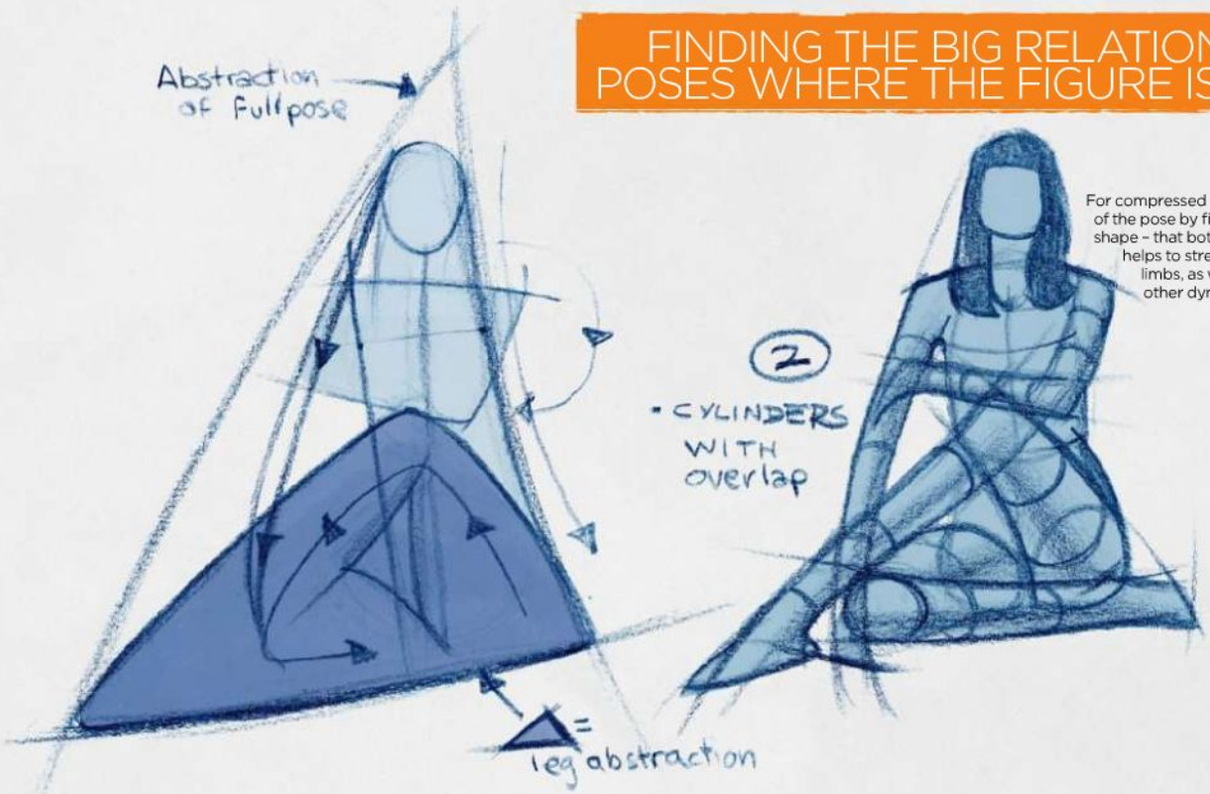
Moving down the legs, the femurs both taper inward, forming a semi-V shape between them. The figure looks knock-kneed at this stage, but that's normal until we place muscles over the bones. In a standing position, the knees are almost directly below the iliac crests of the pelvis. The thigh is divided into three major masses: the front mass, which consists mostly of the quadriceps and sartorius muscles; the inside of the thigh, or adductor muscles; and the back of the thigh, or the bicep mass. All of these muscle groups start out large – the muscle heads account for about two thirds of the length of the leg and taper around the knee as the muscles terminate in tendons, exposing more bone than they cover.

DRAW ARCS TO CONNECT KEY AREAS TOGETHER

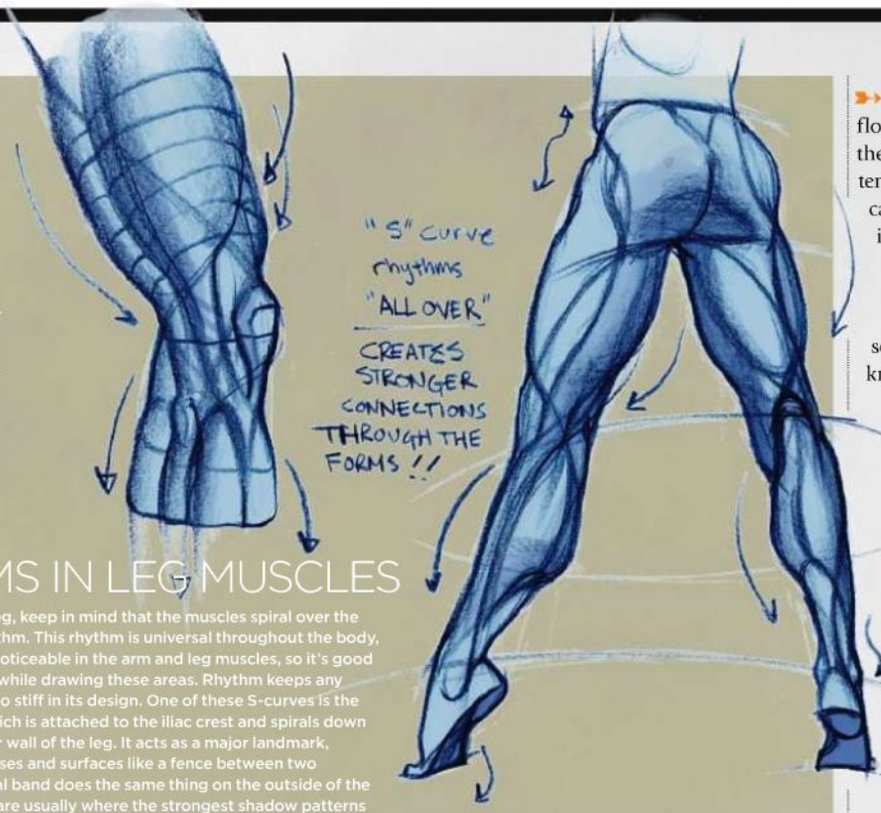


Drawing arcs between all the joints and key features relates the left and right sides of the pose. Understanding figure proportions related to skull size can help you to interpret these arcs with much greater clarity.

FINDING THE BIG RELATIONAL SHAPES IN POSES WHERE THE FIGURE ISN'T STANDING



For compressed or seated poses, I like to start the gesture of the pose by finding the big shapes – or, in this case, the shape – that both legs create together. This abstraction helps to strengthen the relationship between the limbs, as well as keeping the legs relating to each other dynamically and proportionately.



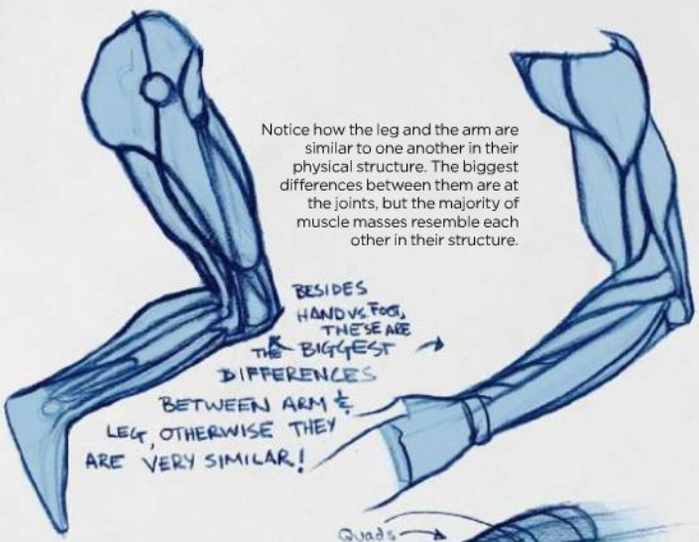
S-curves are found all over the body, and the legs are no exception. Here, the S-curve is found not only in large muscle rhythms, but also in the bones and their connections. The bones through the knee into the shin bone, and the smaller bones around the kneecap, hips and ankles exemplify this.

S-FORMS IN LEG MUSCLES

When drawing the leg, keep in mind that the muscles spiral over the form in an S-like rhythm. This rhythm is universal throughout the body, but it's particularly noticeable in the arm and leg muscles, so it's good to bear that in mind while drawing these areas. Rhythm keeps any form from getting too stiff in its design. One of these S-curves is the sartorius muscle, which is attached to the iliac crest and spirals down and around the inner wall of the leg. It acts as a major landmark, dividing muscle masses and surfaces like a fence between two gardens. The iliotibial band does the same thing on the outside of the leg. These divisions are usually where the strongest shadow patterns are formed on the legs, regardless of how active the pose is.

The kneecap itself is a small free-floating bone that hovers over the head of the femur and is attached to the leg by tendons coming from above and below the cap. The most prominent of these tendons is the large rope-like cord that extends below the kneecap to the forward protuberance of the tibia, or shin bone. The kneecap or patella is shaped somewhat like a pentagon. When the knee is bent, the larger shape of the leg mass between the femur and the shin bones echoes the shape of the patella with a five-sided form. In this position, the side walls are more flat than angled.

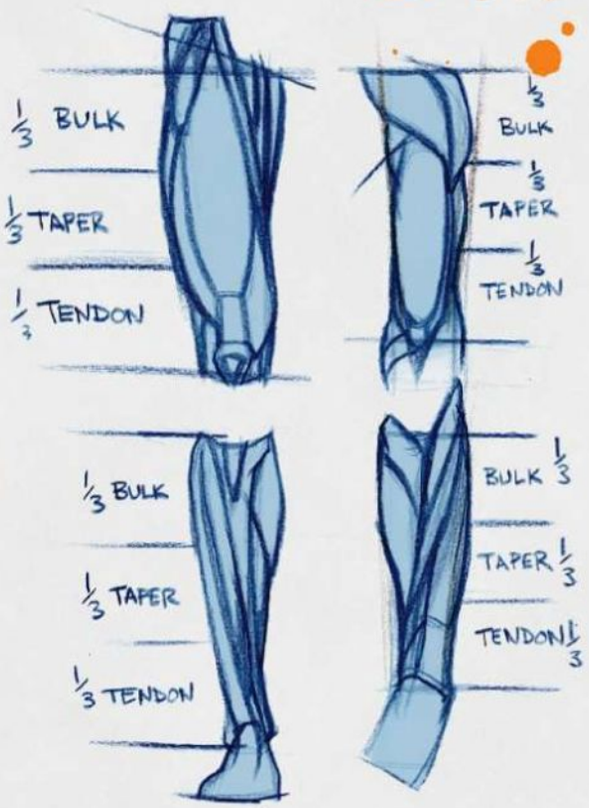
The lower leg is more triangular than cylindrical in its cross-section. The shin bones form a wedge, with the sharp edge facing forward and the wide side as the calf muscles. The lower half of the leg is about two thirds muscle mass, tapering to a block form at the ankles, with the inside of the ankle higher than the outside. The lower leg forms a bowling pin shape, similar to the forearm, and the foot fits

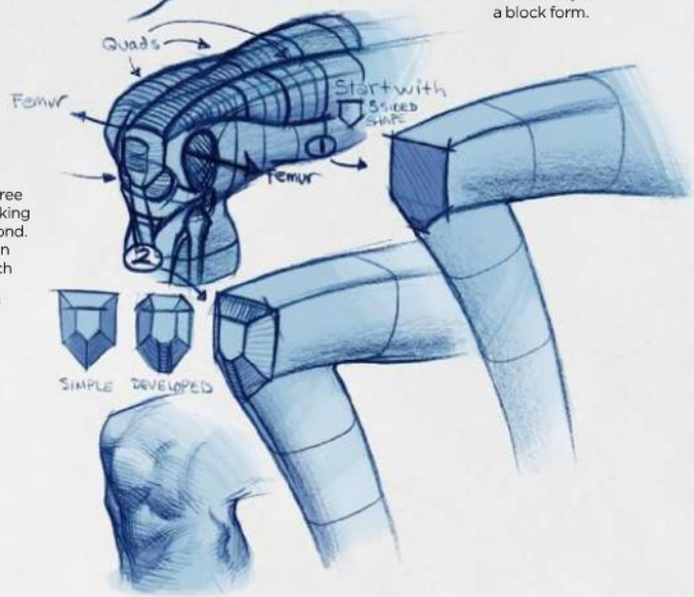


Notice how the leg and the arm are similar to one another in their physical structure. The biggest differences between them are at the joints, but the majority of muscle masses resemble each other in their structure.

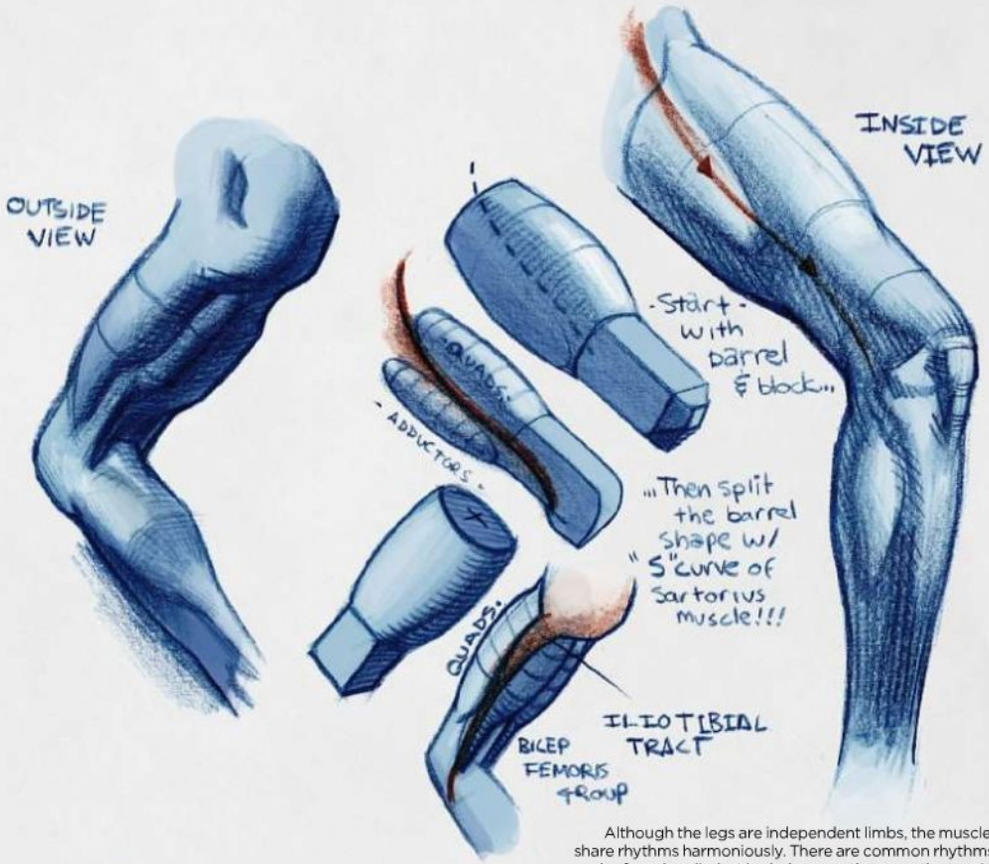
COMPARING LEG MUSCLES TO THE ARM STRUCTURE, AND MAPPING OUT THE KNEE

The arm and leg have quite similar proportions with regard to tendon mass versus muscle mass; even the upper and lower portions of the limbs have similar divisions. The upper two thirds of each segment is muscle mass, the upper third usually contains the largest bulk of muscle and the lower third is mostly made up of bone and tendon. The upper part of each segment is rounded like a cylinder, and the lower parts (wrists and ankles) terminate with a block form.

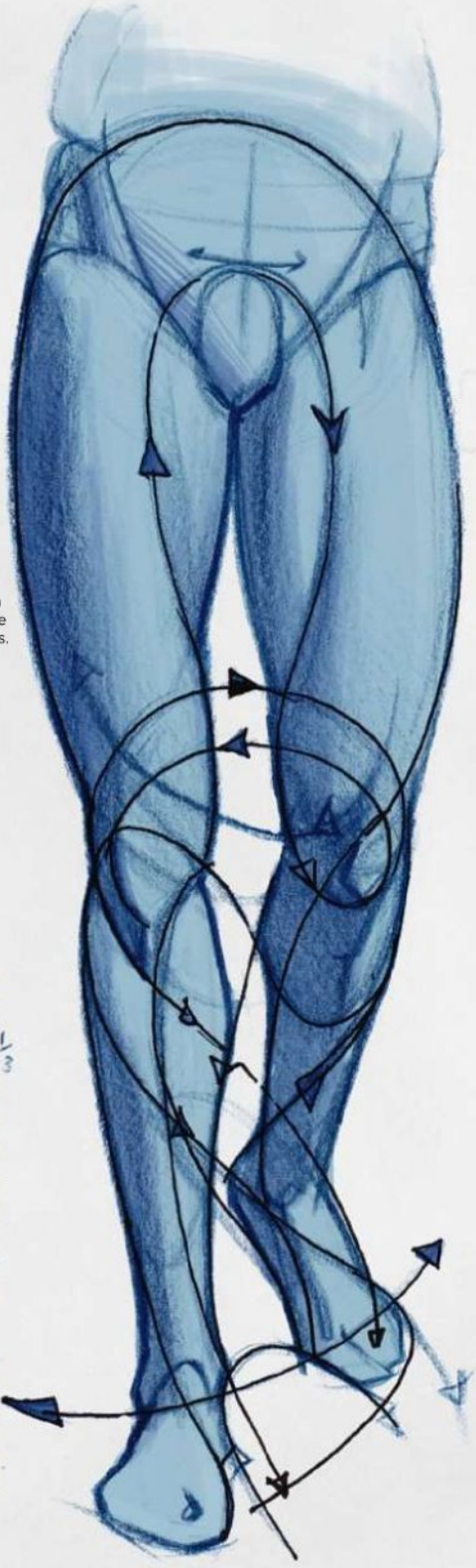




The knee can be designed with three vertical planes and three horizontal planes, looking like the top of a diamond. Structuring the knee in this way makes it much easier to map the undulating furrows of the bones.



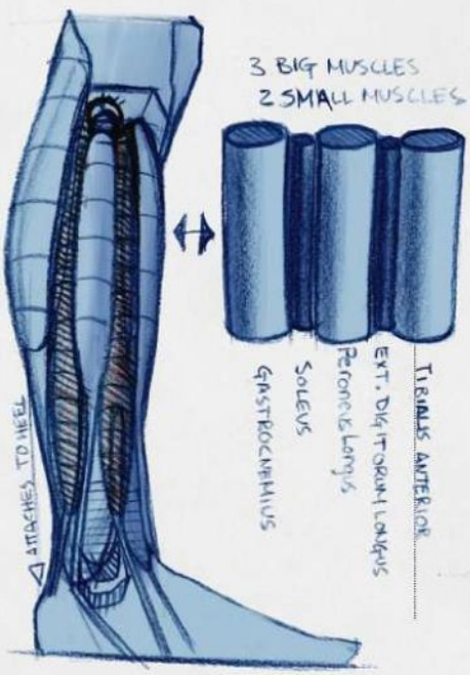
Here you can see how the sartorius on the inside of the leg splits the barrel shape into two parts, while the iliotibial band on the outside of the leg divides the front from the back. These two prominent separations are usually visible, so don't ignore them.

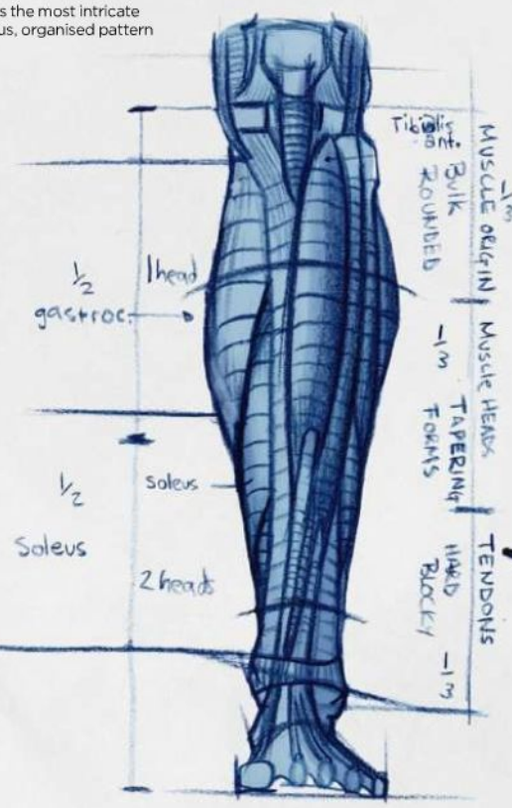


Although the legs are independent limbs, the muscles of both share rhythms harmoniously. There are common rhythms that can be found easily, but look deeper – the more the two legs can be related, the more harmonious and fluid the entire pose feels.

USE PISTON SHAPES TO CAPTURE THE REGULARITY OF THE SHIN

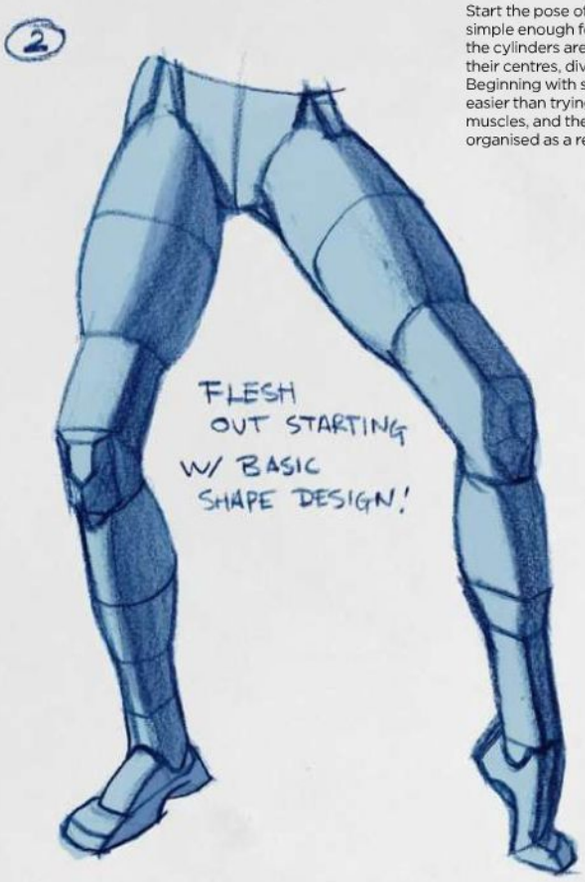
As bony as it looks, the shin is surrounded with muscles. The outside surface has the most intricate complexity to it, with a repetitious, organised pattern of piston-shaped muscles.



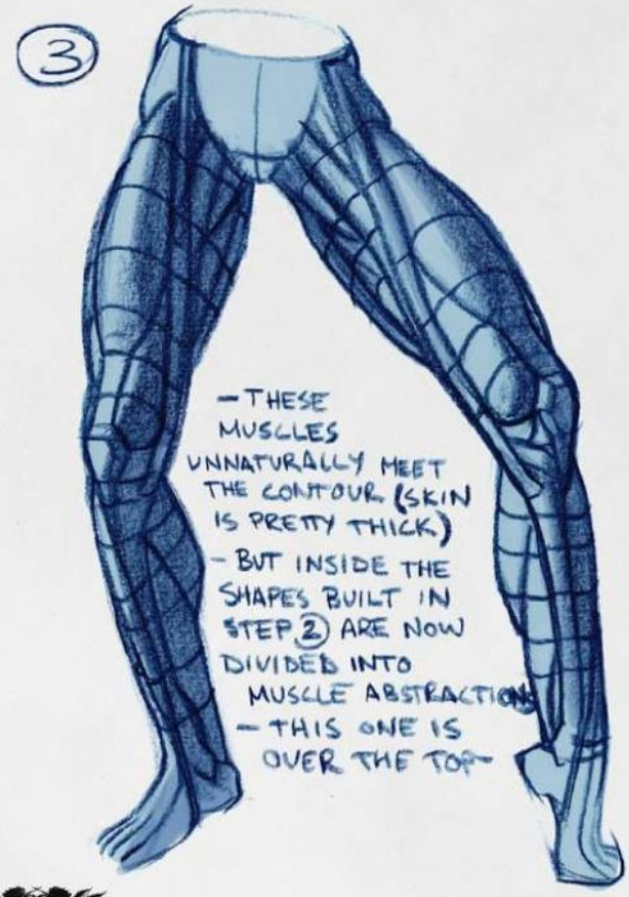


BUILD UP LEG MUSCULATURE IN THREE SIMPLE STAGES





Start the pose off with cylinders: they're simple enough for anyone to draw. Once the cylinders are placed and you've found their centres, divide them into planes. Beginning with simple surfaces is much easier than trying to start with the muscles, and the legs look more organised as a result.



“Stick to muscle groups rather than individual muscles. Only the muscles that are being used show more detail, expanding as their fibres bunch”

in neatly at the base of the pin. When developing the legs, stick to the muscle groups rather than focusing in on individual muscles. Only the muscles that are being used should show more detail, expanding as their fibres bunch together. If unused or not fully taut, the muscles blend into their respective groups or, if really relaxed, back into their biggest basic shape.

One important point: remember that legs come in pairs. Be sure to relate the two legs to each other throughout the early stages of the drawing, making sure that the action doesn't destroy the proportions and balance of the pose. If the legs look off from each other, then the entire pose feels off. Balance starts from the bottom up, so if you start the drawing with simple forms and sound placement, the rest practically takes care of itself.



Using the simple rules of form and function, you should soon be able to work yourself up a pretty fine pair of legs. Just don't forget to take proportion and muscle use into account.

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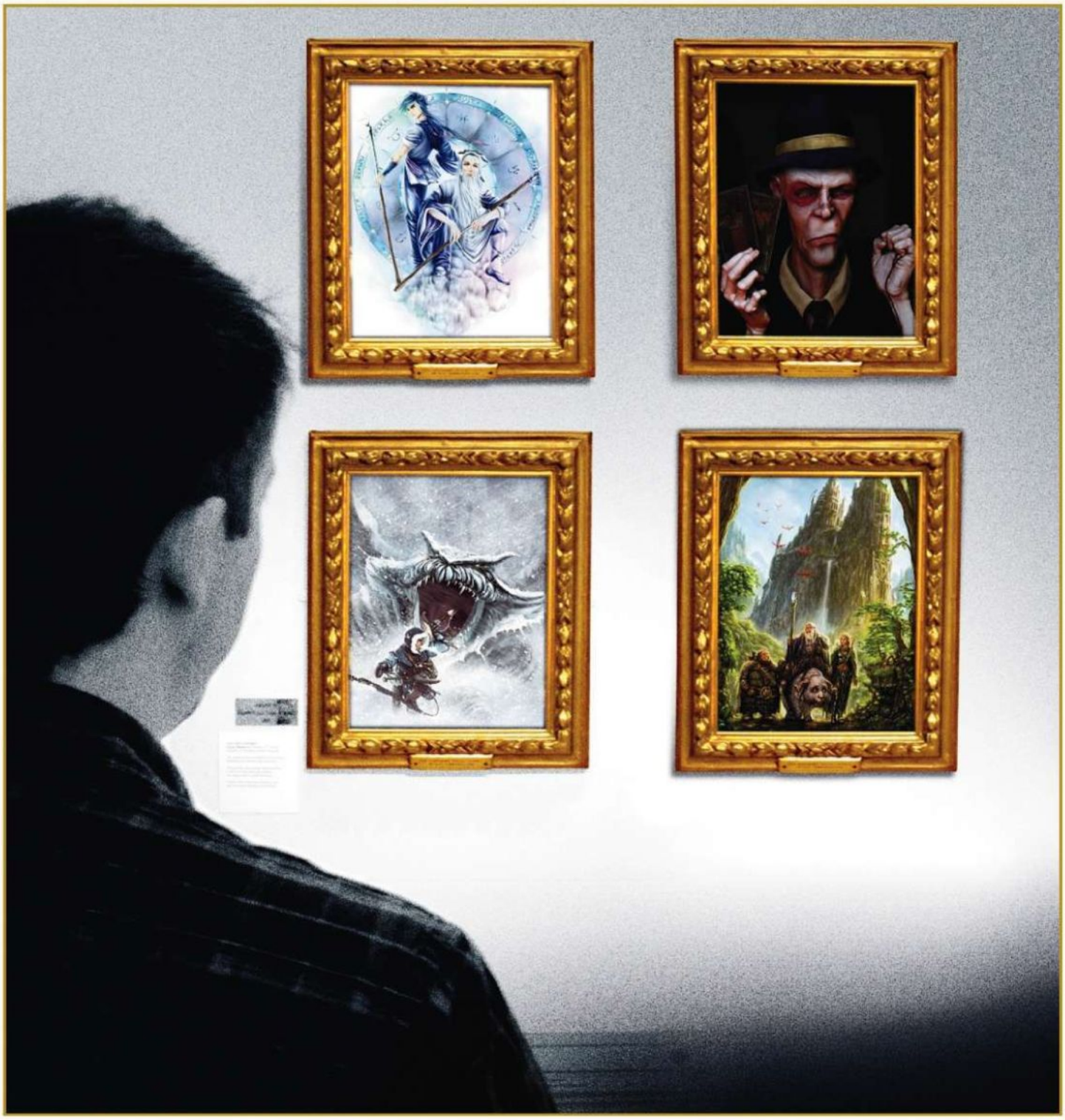
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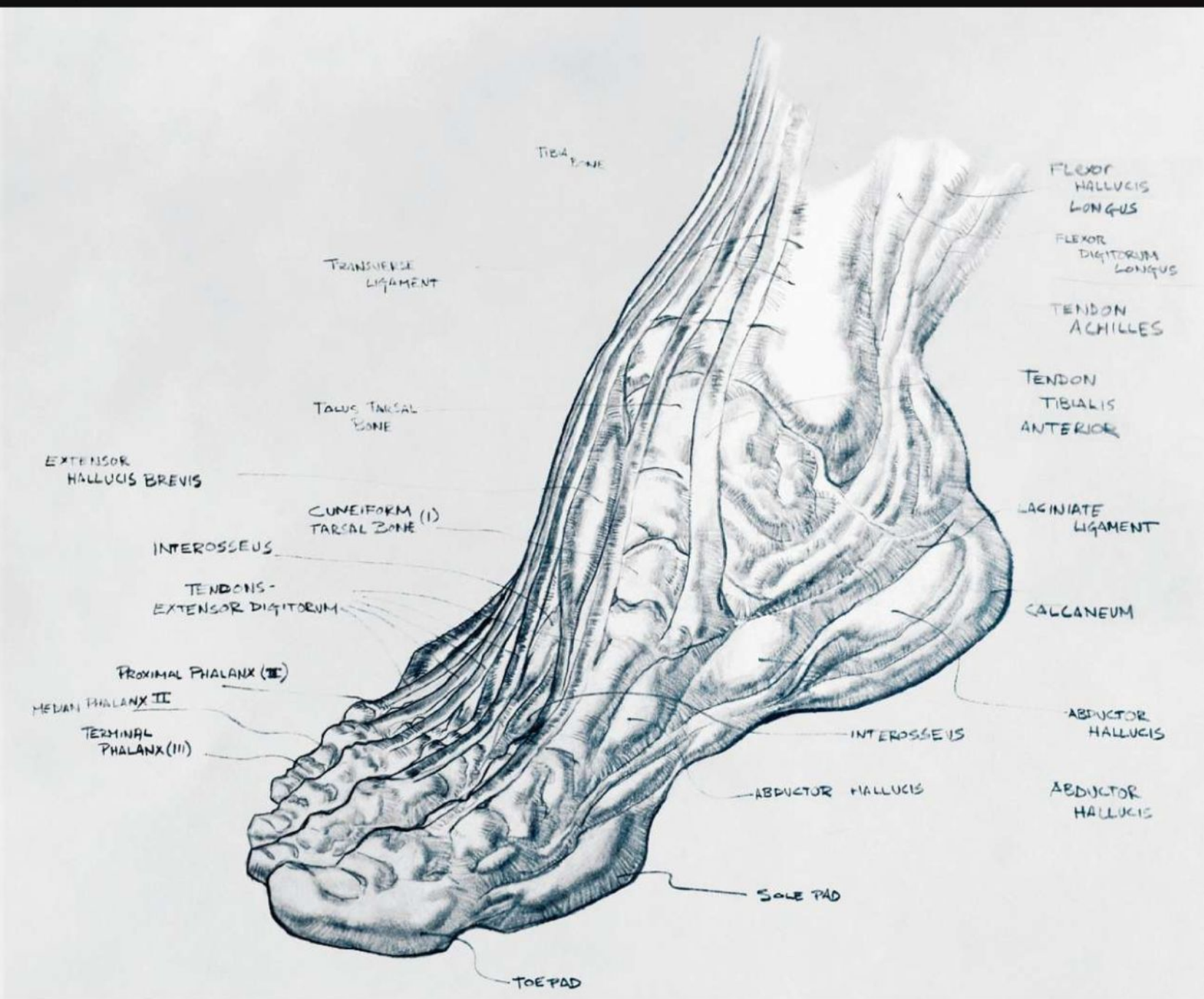


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PART 4

DRAWING FEET

Discover how to use form to create solid-looking feet – and why you shouldn't use too much detail when you draw them

Artist PROFILE



Ron Lemen
COUNTRY: US

See more of Ron's work at his website
www.studio2ndstreet.com

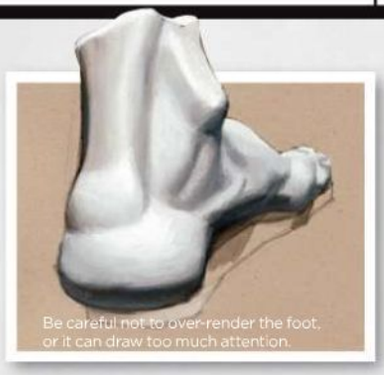
On the disc
Find reference sketches by Ron in the Feet folder inside Human Anatomy

Let's clear the air about feet – the ugly cousins to the hands and a part of the body that many artists dread to draw. They're bony, they're complex and, let's face it, they're not the nicest things to look at. But anyone who's serious about figure drawing is going to have to tackle feet at some point. Even if you intend to only ever draw characters who have shoes on, your drawings will only be convincing if you have a good grasp of how to structure the feet inside the shoes.

Storyboards, pin-ups, covers, character designs, movie posters, comic books… all of these are instances when you might want to draw a full figure from head to toe. This means that you have to put feet on the legs. As painful as this can be to master, it is a must-do, must-learn situation. Here are some helpful hints and solutions to tackling these little beauties, helping you on your way to achieving the sweetest feet.

Get a foothold: drawing perfect feet

Put feet into perspective and start with footprints as the foundation for the correct overall pose



Be careful not to over-render the foot, or it can draw too much attention.

Let's start by looking at size. The typical foot is between 10 and 12 inches in length. Roughly speaking, that's about as long as the entire skull from top to chin. The foot's width is a bit less than half the width of the head, or about the same width as the hand's four fingers (excluding the thumb). You can readily see these measures for yourself with your own hand and foot.

To start a full-figure drawing or even a three-quarter drawing of a figure, it would be wise to begin with the ground plane to work out the correct perspective in the shot, relating the figure to the rest of the environment so it feels truly planted in the world. The perspective will help keep the foot in correct scale to how you see the action, to the character's head, and to the viewer, as well as keeping it at the correct skew – if there is any – from camera distortion.

I begin by drawing footprints on the floor (or steps, or slope; wherever the foot is to be located). This can make it easier to draw the legs with the right foreshortened look to them and with the correct action to the pose.

Boots and shoes usually cover the feet, but I recommend that you start with the foot without a cover over it, so there's a proper scale of foot size to the figure before any distortion created by the shoe design occurs. Feet are sometimes drawn oversized for weighting or stylistic reasons, but I would still draw the foot bare before covering it with a big shoe design, so that the foot relates back to the scale of the rest of the character.

> **Begin with the ground plane to work out the correct perspective in the shot**

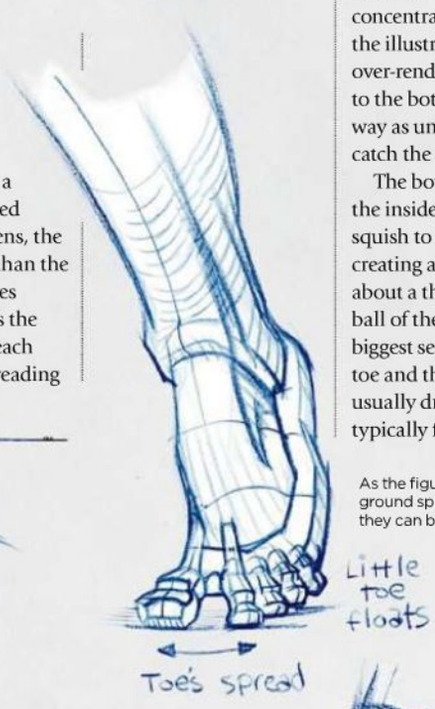
Toes are bulbous at the end, which means they're rounded like a bubble, but squish flat when pressed against a surface. When this happens, the toe mass spreads out a bit further than the toe's actual size, usually joining toes where they come together. If this is the case, don't draw lines in between each toe: this has the visual effect of spreading them apart from each other. Use simple tones or light gradations to join the mass and separate the toes.

Toes step downward like stairs from the metatarsal bone to the toe's tip. There are many little complex surfaces, from bone top to knuckles and nails, that can be rendered or shaded to give the feet more dimension and complexity.

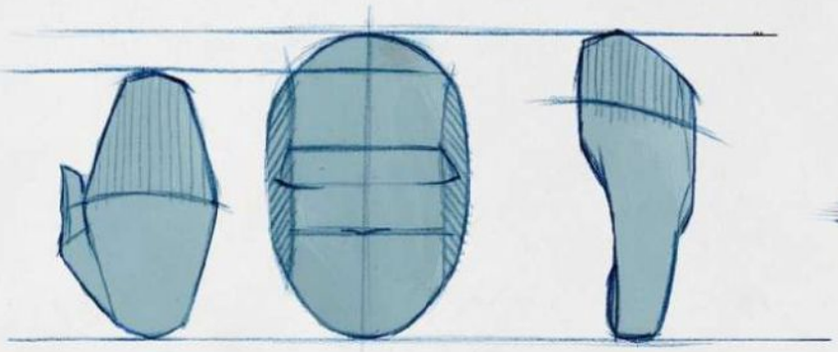
Defining the toes

Be careful not to add too much detail to the toes if the foot is small in the illustration: too much rendering in such concentrated spaces can force the rest of the illustration towards a direction of over-rendering. It can also push the focus to the bottom of the picture in the same way as under-scaling the feet, unless you catch the mistake early enough.

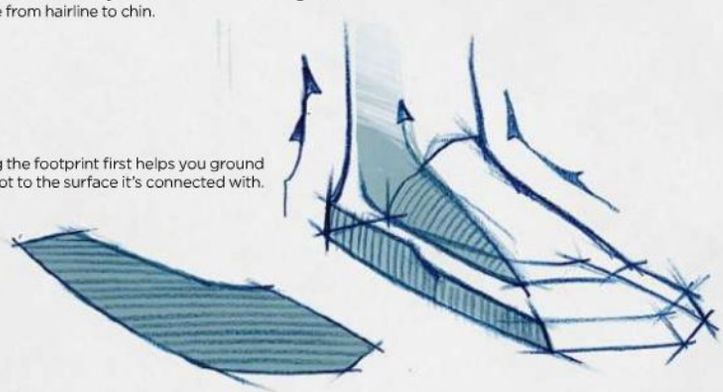
The bottom of the foot has an arch on the inside and two separate pads that squish to whatever they press against, creating a straight line. The toes bend about a third of the way back behind the ball of the foot. When the toes spread, the biggest separation occurs between the big toe and the second toe. The little toe is usually drawn as a bulbous shape. It typically floats a bit more off the



As the figure's leg lifts, the toes on the ground spread out – one of the few times they can be drawn separated.



The footprint is as long as the entire skull from top to bottom – the same way the hand is the same length as the face from hairline to chin.

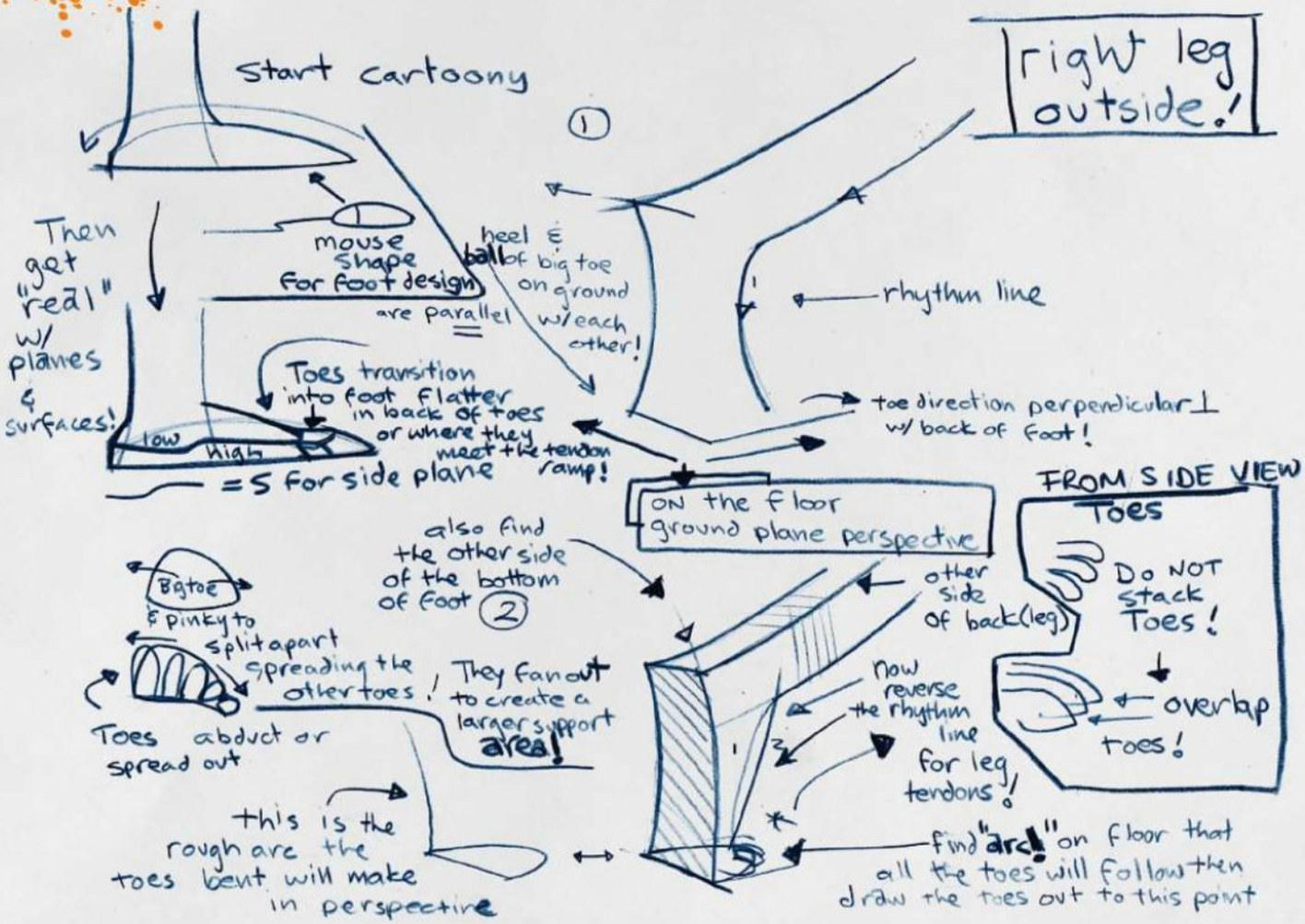


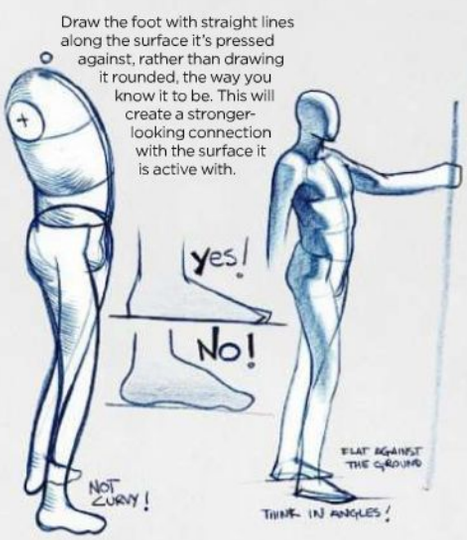
Drawing the footprint first helps you ground the foot to the surface it's connected with.



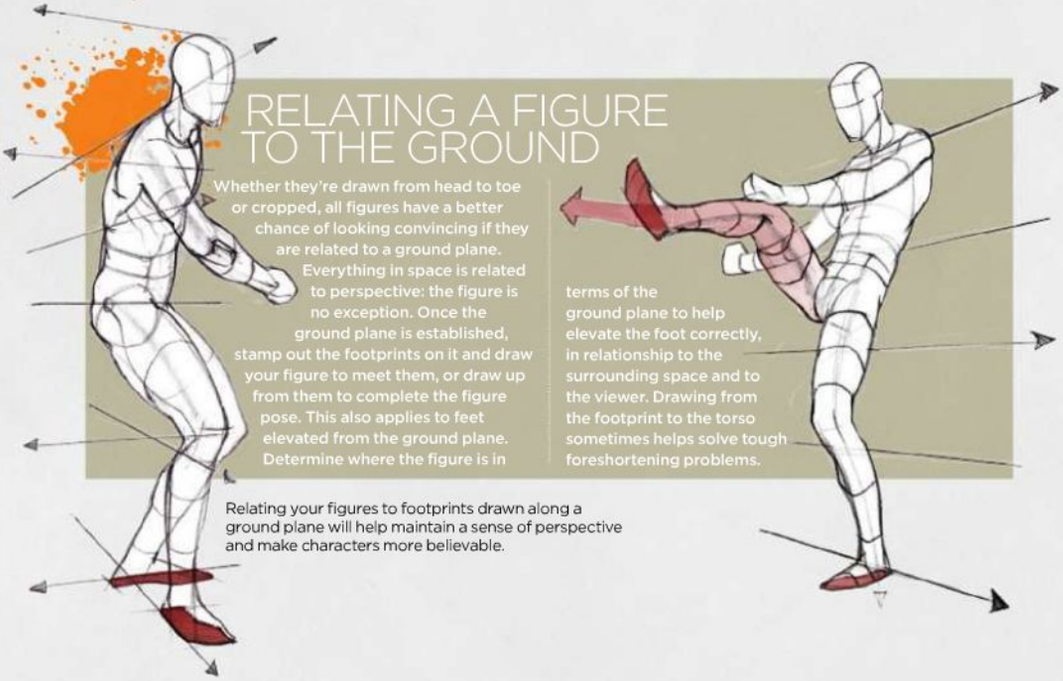
The toes bend behind the ball of the foot, not in front of it.

FEET FROM THE GROUND UP: USING FORM AND PERSPECTIVE





Draw the foot with straight lines along the surface it's pressed against, rather than drawing it rounded, the way you know it to be. This will create a stronger-looking connection with the surface it is active with.

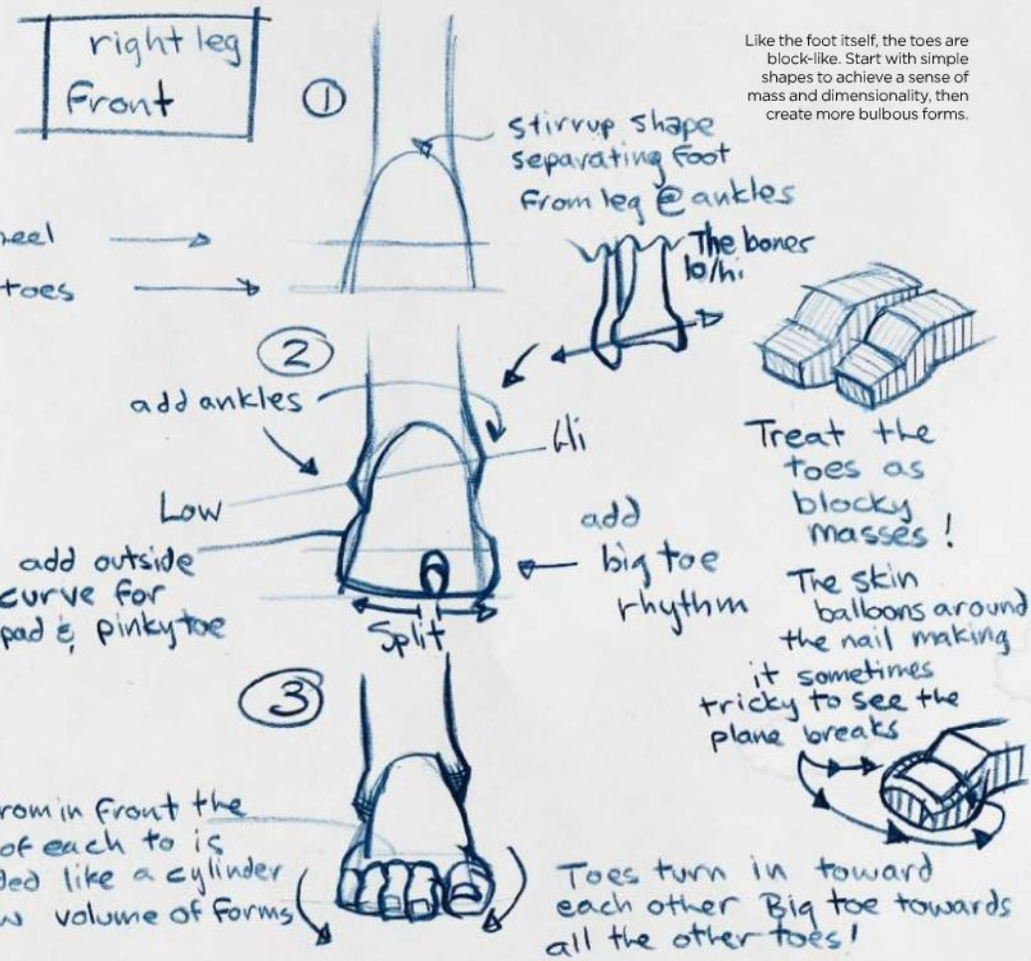


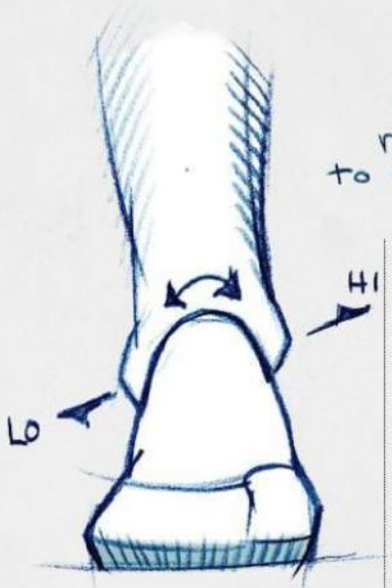
RELATING A FIGURE TO THE GROUND

Whether they're drawn from head to toe or cropped, all figures have a better chance of looking convincing if they are related to a ground plane. Everything in space is related to perspective: the figure is no exception. Once the ground plane is established, stamp out the footprints on it and draw your figure to meet them, or draw up from them to complete the figure pose. This also applies to feet elevated from the ground plane. Determine where the figure is in terms of the ground plane to help elevate the foot correctly, in relationship to the surrounding space and to the viewer. Drawing from the footprint to the torso sometimes helps solve tough foreshortening problems.

Relating your figures to footprints drawn along a ground plane will help maintain a sense of perspective and make characters more believable.

CONNECTING THE FOOT TO THE LEGS OF YOUR CHARACTER





The ankles can be thought of as a stirrup shape to help relate them to one another. The inside anklebone (maleolus) is higher in elevation than the outside ankle bone.

> **Start without boots or shoes to get a proper scale of foot size that relates to the rest of the character**

ground when the foot is arched up, but with the toes still making contact with the ground plane. The big toe points in towards the other four toes, and these toes bend towards the big toe.

Don't forget that the foot is a full shape with six sides, like a block, with corresponding shading planes. Draw through the form to generate a more solid-looking and dimensional form.

When you've perfected your feet, you'll want to add them to the rest of the character. Now's the time to consider ankles and legs. See in my diagrams above how I've drawn the right foot and started to attach it to the right leg. I've shown the connection from a front perspective in these examples.

The ankles connect the feet to the legs. For easier ankle drawing, it helps to think of them as a stirrup-like shape. The inside anklebone is more elevated than the outside one.

Feet have typically been the bane of many artists. Some illustrators hide them with smoke, push them into silhouettes and shadows or even crop the image to avoid drawing them. But when an artist can draw them correctly, how much character they add to the image! The hands and feet can say just as much as a convincing facial expression.

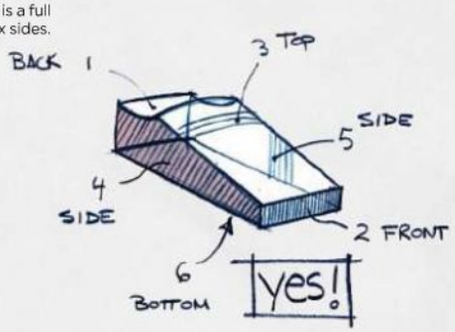
Because of their complexity and gesture or action, feet usually become a secondary or tertiary focus in a figure drawing. It's a good idea to tackle these difficult issues early on and ideally make it second nature to design them convincingly. You would be surprised how many people will comment on how well feet are drawn if they really are; it's not every day that you find an artist with a real understanding of the ground they stand upon.

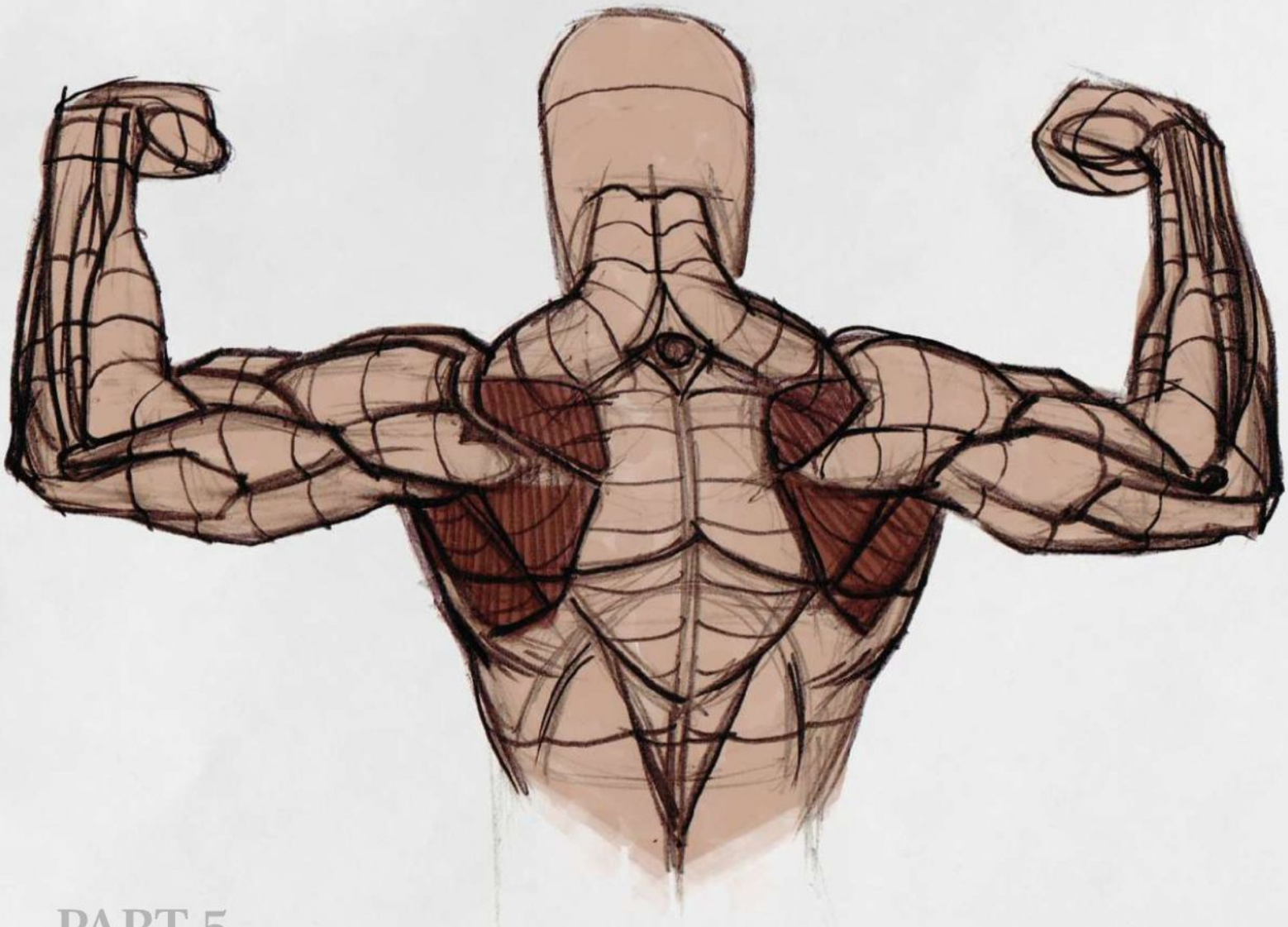


Overlap the toes when the foot is not drawn straight on. This will avoid the 'clump of bananas' look, and help the foot look less cartoony.



To achieve a more solid dimensional form, bear in mind that the foot is a full shape with six sides.





PART 5

DRAWING THE SHOULDER AND UPPER ARM

Don't allow the complex interaction of muscles in this area to distract you from anatomy's guiding principles

So far we've seen how to define the armature of the figure and its underlying gesture, before starting to flesh our figure out with the torso and legs. We continue our journey with the upper part of the arms and the way they connect to the shoulder, one of the more complicated spots on the body to draw. The place to start is at the skeletal structure. Understand the shape of the scapula and humerus, especially the edges of the scapula and the ends of the humerus. Without knowing the bones and their shapes, the muscles have nowhere to start or terminate. Keep in mind that the diagrams I have drawn are mostly fleshed over, so the points where the muscles attach are covered – but the shapes are solid and directional, because of where the muscles attach to the bones.

Artist PROFILE



Ron Lemen
COUNTRY: US

See more of Ron's work at his website
www.studio2ndstreet.com

On the disc
Find sketches by Ron in Shoulders and Upper Arms inside Human Anatomy

Learning the relationships between muscle and bone

Drawing the shoulders to complement the action of the upper arm muscles

Drawing this part of the body begins much like any other part. First gesture in the pose, then accent the lines you feel good about using for the final pose before starting to define the body masses in more detail.

When drawing the figure, a clear understanding not just of the muscles, but what the skeleton looks like beneath all the muscle masses is needed to draw muscles with any believable visual action to them. Without this understanding and observation, the muscles can end up drawn as bubble shapes that are lifeless, weightless or competing against the action you want to depict.

Shoulder structure

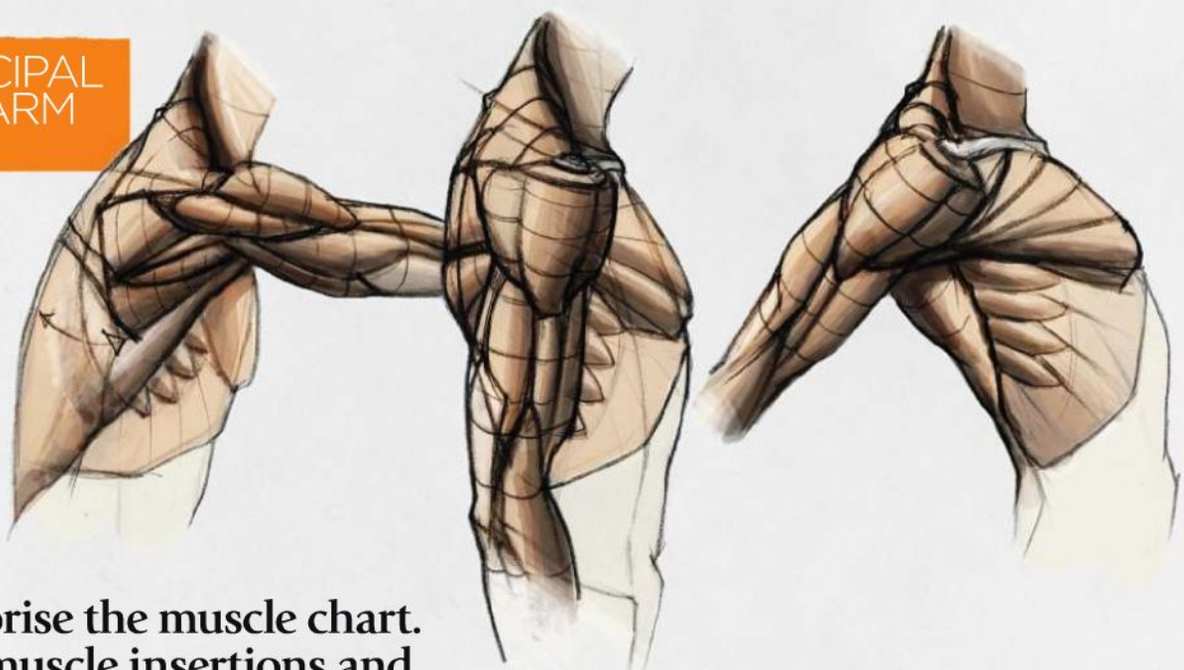
The shoulder floats over the ribcage, with only the clavicle at the sternum on the ribcage acting as an anchor for the entire arm. This means that the arm has a lot of free motion over the ribcage.

When drawing the arm connected to the body, you need to first find the correct action of the shoulder to avoid a stiff-looking drawing. For example, if the arm is winding up to throw a ball, the ➤➤



This drawing is all about the shoulders and the upper arms. Note how the shape and form of the forward-pointing left arm is entirely different to the right. Think about how the muscles and bones are moving and interacting with the skin and the light.

THREE PRINCIPAL STAGES OF ARM MOVEMENT



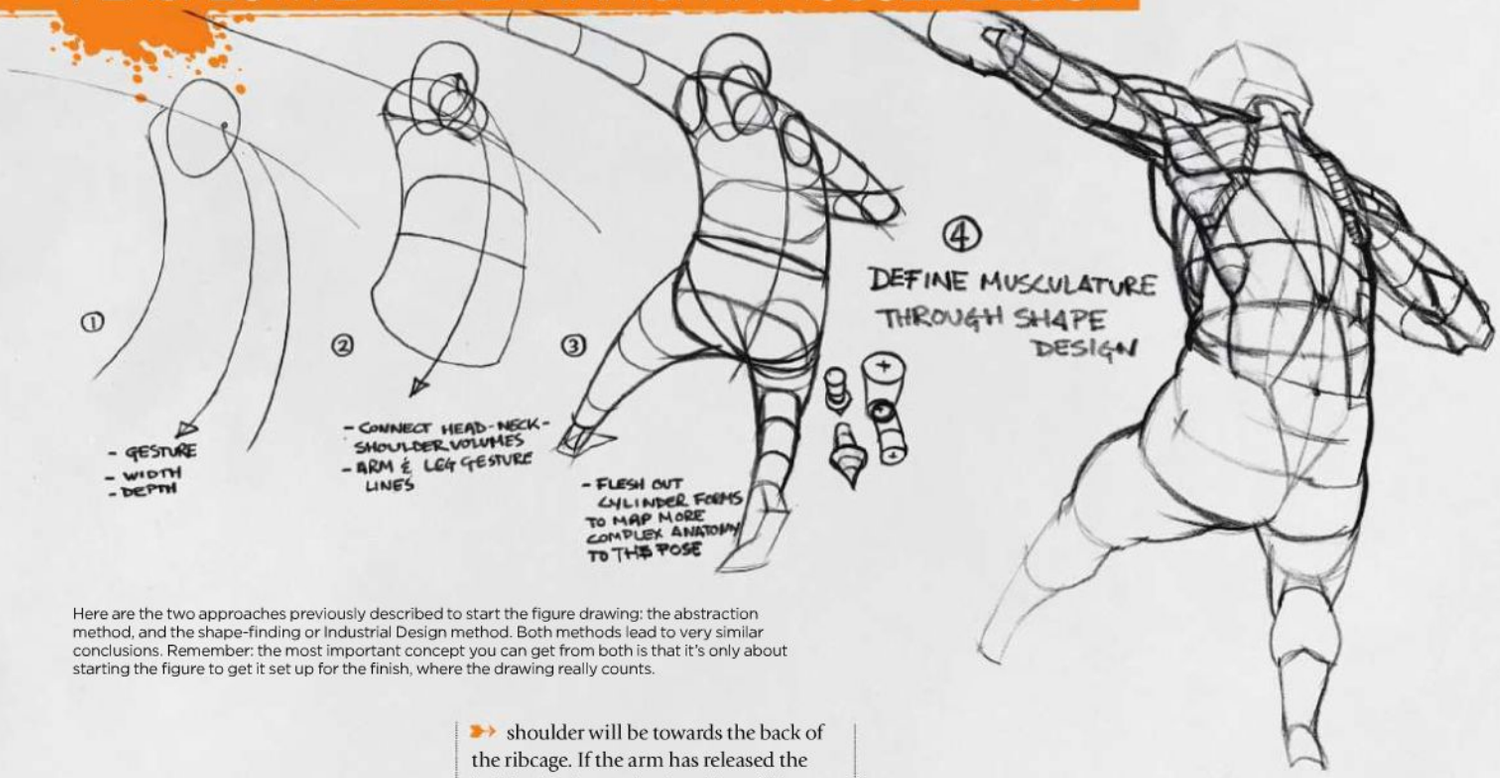
The shoulder has quite a bit of movement around the ribcage. Here you can see three positions of the arm. The first is forward, moving the attachment of the deltoid forward and stretching the shoulder muscles. The second is in a reference position, by the side of the ribcage. More of the back of the arm and shoulder show when the arm is relaxed in this position. Meanwhile, for the third position, the shoulder is pitched back behind the body. The shoulder is now behind the ribcage, stretching the pectoralis muscles and serratus muscles.

“Don’t memorise the muscle chart. Memorise the muscle insertions and connections to the bones”



Here we see the shoulder from behind the ribcage. Line A of the first ribcage represents the rhomboid and trapezius muscles, bunched up between the spine and the spine of the scapula. Line B represents the crease under the scapula that follows the serratus muscles. Line C splits around halfway between the shoulder muscles perpendicularly.

PERSPECTIVE AND DYNAMISM IN MUSCLE DESIGN



Here are the two approaches previously described to start the figure drawing: the abstraction method, and the shape-finding or Industrial Design method. Both methods lead to very similar conclusions. Remember: the most important concept you can get from both is that it's only about starting the figure to get it set up for the finish, where the drawing really counts.

FOLLOWING THE RHYTHM OF MUSCLES

"When drawing the arm connected to the body, we need to first find the correct action of the shoulder in order to avoid a stiff looking drawing"

shoulder will be towards the back of the ribcage. If the arm has released the ball in the throw, the shoulder will be more forward over the ribcage. If the hands are held high above the head, the shoulders are closer to the ears.

Each set of muscles crosses over from one bone to another. For example, the shoulder starts in the torso, connects to the clavicle and the scapula, and terminates at (or crosses over and inserts onto) the upper arm bone, known more formally as the humerus.

The muscles of the upper arm originate both on the humerus and on the scapula, and terminate on the two forearm bones, known as the ulna and the radius. The hands and feet are a few places on the body where the muscles are referred to as intrinsic: they stay within the bone mass. Otherwise, muscles connect two or more different bone groups together.

The scapula floats over the serratus muscles, which we see as little bump muscles on the ribcage under each arm, or the 'superhero muscles'. The shoulder muscles all start on the spine edge of the scapula, and cross over to the top or the upper third of the humerus. These four muscles help rotate the upper arm rotate out and in from our body – when you hold both your arms out like a cross,

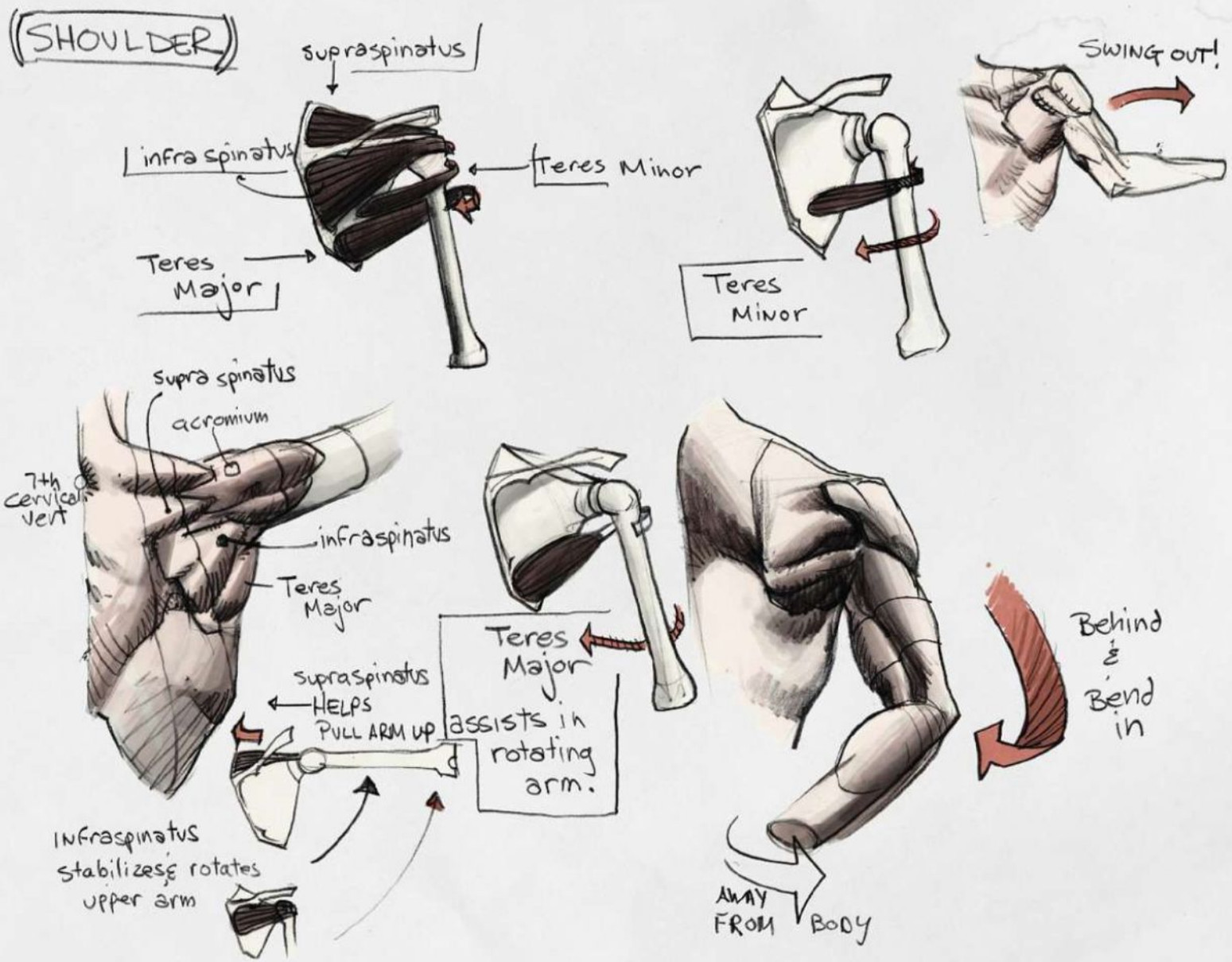


These lines represent the rhythm lines, or the abstraction lines that flow between the muscles once the architecture has been designed. These lines help harmonise the muscle forms to create a seamless rhythmical movement of muscles, bones and ligaments.

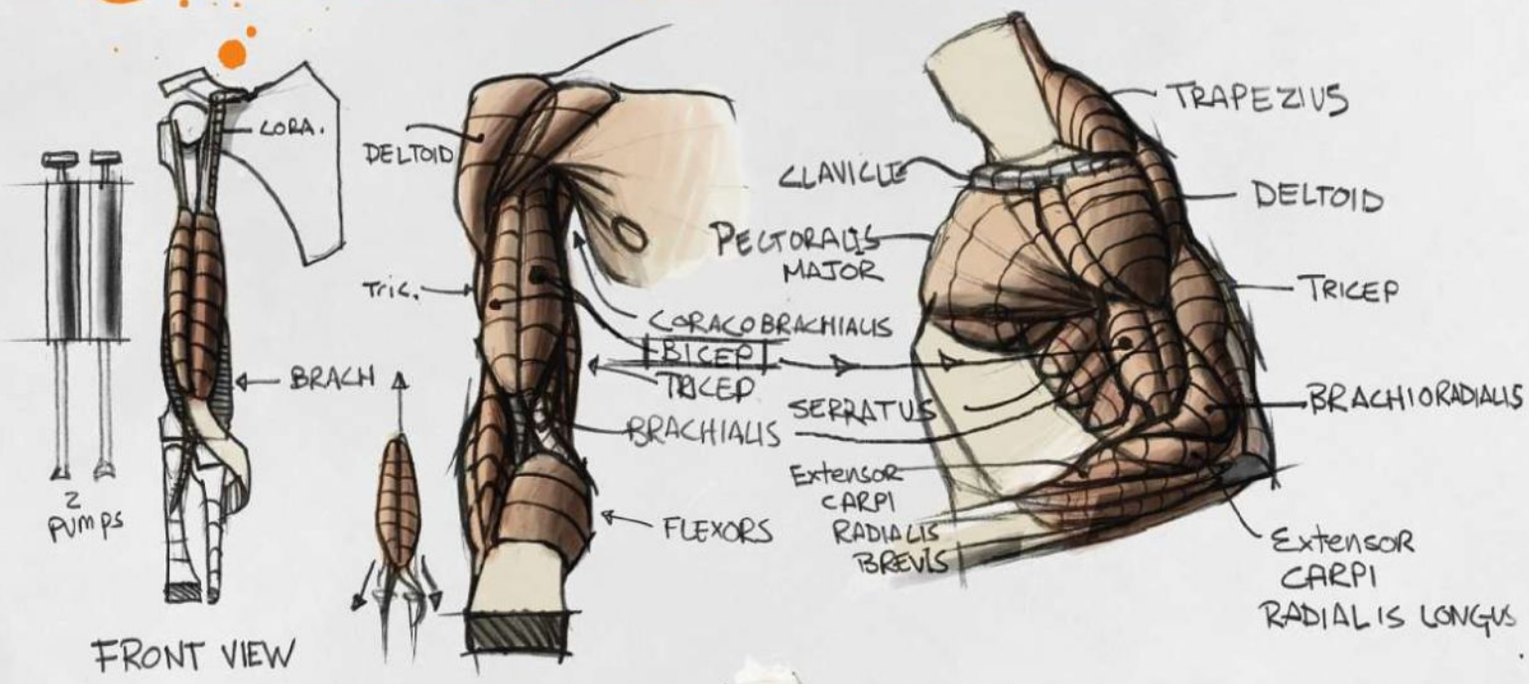
THE GEOMETRY OF THE HUMAN FORM

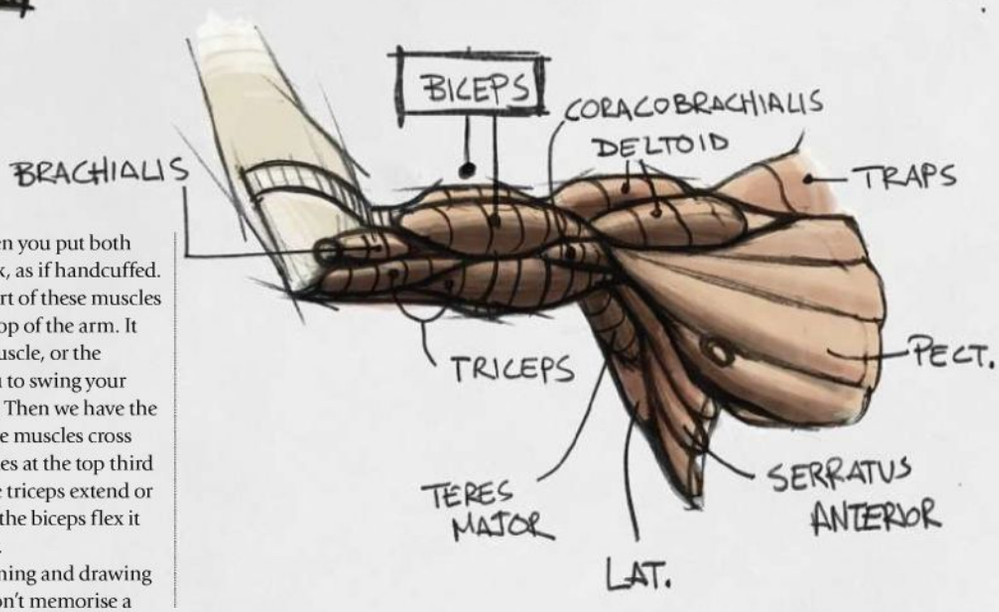


Draw muscles with simple geometry to understand and memorise them, or to turn them into something that you can remember easily. Here are the four muscles inside the scapula. Each muscle is drawn individually to help you understand the shape, where it starts – or where it's connected – and where it goes to. This is important information to remember, because all the lumps, bumps, dark spots and highlights you see on the back only show up when the arm is active.



HOW MUSCLES CONNECT, MOVE AND INTERACT





Here, the arm is pulled behind the body, causing several creases to occur. These creases run perpendicular to the muscle striations of the muscle heads. The three creases here are along the base of the oblique; under the serratus muscles and through the lattisimus and the rhomboid; and under the scapulas base edge.

for example, or when you put both hands behind your back, as if handcuffed.

The deltoid covers part of these muscles and wraps around the top of the arm. It functions as a swivel muscle, or the muscle that enables you to swing your arm round like a wheel. Then we have the biceps and triceps. These muscles cross over to the forearm bones at the top third of the the humerus. The triceps extend or straighten out the arm; the biceps flex it or draw it into the body.

I urge caution in learning and drawing muscle distribution. Don't memorise a muscle chart. Memorise the muscle insertions and connections to the bones, or where the muscles originate from and where they end on the skeleton. Learn their function and action and group them so you are not drawing every muscle.



> **"The muscles should be drawn only when active, not charted and shaded like a muscle diagram"**

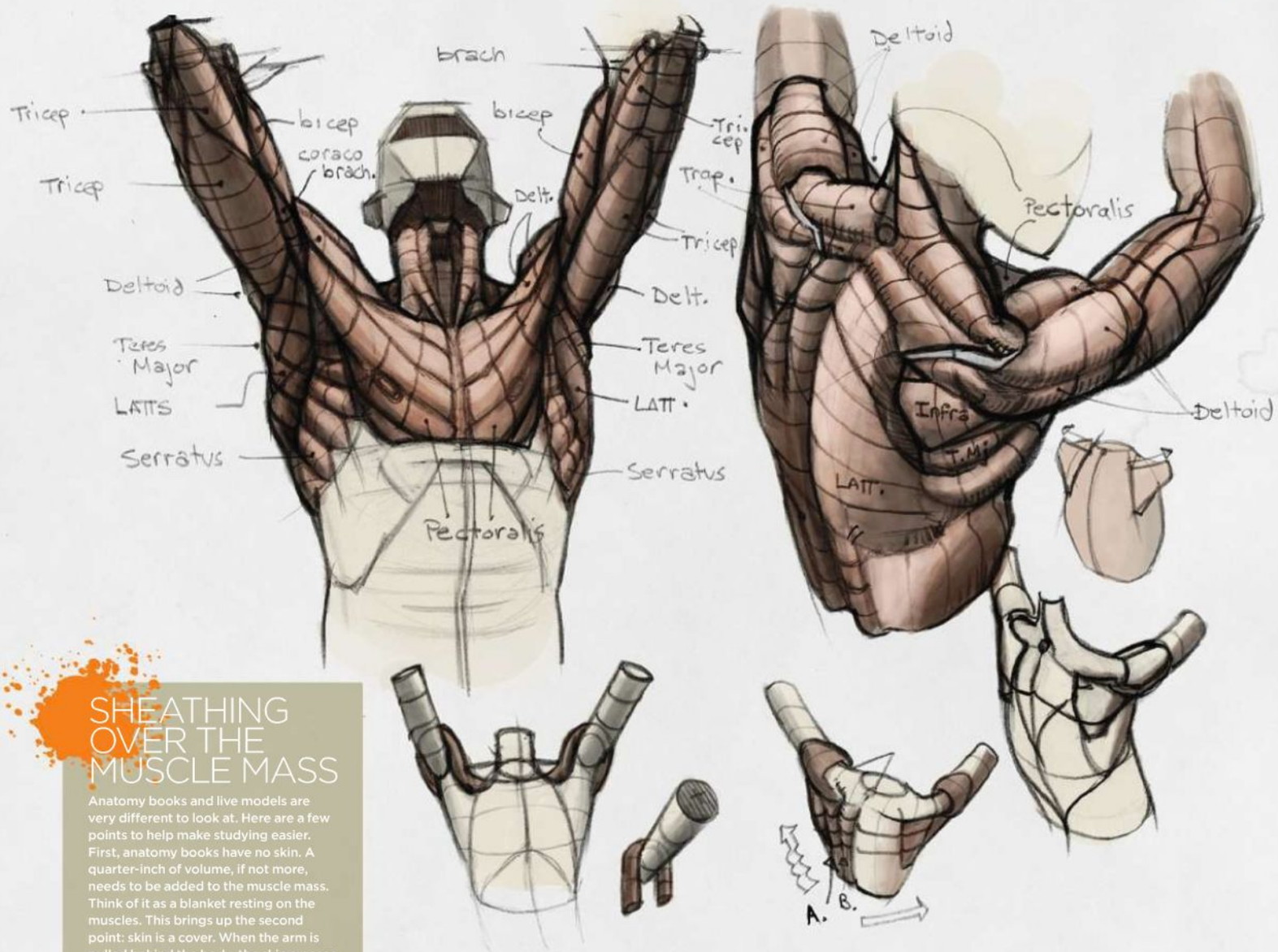
Shoulder structure

Let's now have a look at the anatomy of the upper arm and shoulder. These muscles in particular should be drawn only when active, not charted and shaded like a muscle diagram: most humans don't normally look this way, even when well developed. Body-builders create a Living Human Anatomy Chart with their bodies, and we should thank them to some degree – but keep in mind that these muscles are developed to their limits, and are not the shapes we easily identify with.

The muscle charts you see in an anatomy book are based on medically ideal bodies. In reality, the size and scale of each muscle vary from person to person, based on their personal activity, diet and other factors. The anatomy books start us at an ideal point of reference. To accommodate all possible body types, you will have to veer away from these and use your eye and guiding principles instead. Art rules are a starting point, only meant to

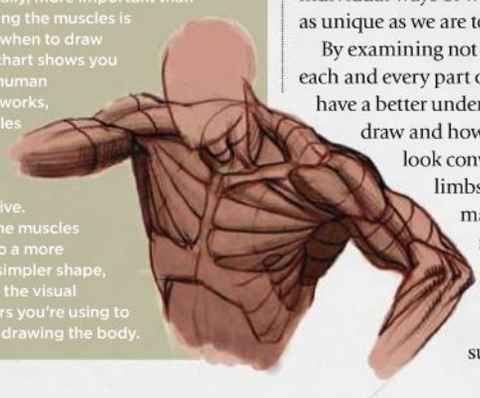
RELATIONSHIPS WITH THE SKIN

Here we see the shoulders in two positions: forward and behind. The left image shows the vertical striations over the muscles where the skin should fold (line A over the shoulder blade, and line B where the rhomboid meets the shoulder blade). The right image shows the muscles from the scapula stretching with the action.



SHEATHING OVER THE MUSCLE MASS

Anatomy books and live models are very different to look at. Here are a few points to help make studying easier. First, anatomy books have no skin. A quarter-inch of volume, if not more, needs to be added to the muscle mass. Think of it as a blanket resting on the muscles. This brings up the second point: skin is a cover. When the arm is pulled behind the body, the skin creases vertically through the shoulder instead of following the muscles horizontally across the back. The muscle fibres go one way; the skin creases perpendicular to them. This occurs everywhere on the body. Finally, more important than memorising the muscles is knowing when to draw them. A chart shows you how the human machine works, but muscles are only clearly visible when active. At rest, the muscles blend into a more generic, simpler shape, similar to the visual metaphors you're using to decipher drawing the body.



be altered with care to enhance our individual ways of working, which are as unique as we are to one another.

By examining not only the limb, but each and every part of the limb, you will have a better understanding of what to draw and how to make the actions look convincing. Studying the limbs one section at a time makes learning and memorising the information much easier to digest.

Anatomy is a large subject to tackle, but it needn't be difficult once you conquer the basics. Breaking each limb down into sections not only helps you take in the information quicker, but also helps to isolate the importance of each part of the body and the important individual characteristics related to those regions. Practise 'til it hurts, then practise some more. Mileage is the key to artistic progress. Enjoy!

This version of the shoulders shows the arms from in front and below the figure. Note how the muscles of the deltoids, pectoralis, serratus and, eventually, the abs and obliques all flow seamlessly together in their striations, and radiate from the shoulders through to the pelvis on either side of the body, using the shoulder as the point of radiation. The deltoid muscles are draped over the arms, seen both from in front and behind. Think of the muscle draped like a towel over the shoulder.

PART 6

DRAWING THE FOREARMS

It may seem like a simple area of the body, but the forearm is more sophisticated – and elegant – than you suspect



Artist PROFILE

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COUNTRY: US

See more of Ron's work at his website
www.studio2ndstreet.com

On the disc
Find reference sketches by Ron in the Forearms folder inside Human Anatomy

In the previous section, I went over the actions of the upper arm, starting with the shoulder blade. This time we'll touch on the rest of the arm, from the elbow down to the wrist.

Before discussing the specific anatomy, however, I want to mention something about function. Each segment of the body operates the next one down the chain. For example, the muscles of the shoulder function to lift the arm, the biceps and triceps operate the forearm, and the forearm muscles dictate the actions of the hand. This rule is important to remember when drawing: it helps you to avoid stiffness in your composition by making you think not so much of individual segments, but of the action as a whole. This is something we can think about another time, but it's important to

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MUSCLE MOVEMENT

This diagram shows the way the muscles cross over the bones, or spiral from one side of the arm to the other. The muscles as a group are all attached in roughly the same location, then spread across the wrist before terminating in the hand or at the fingertips.



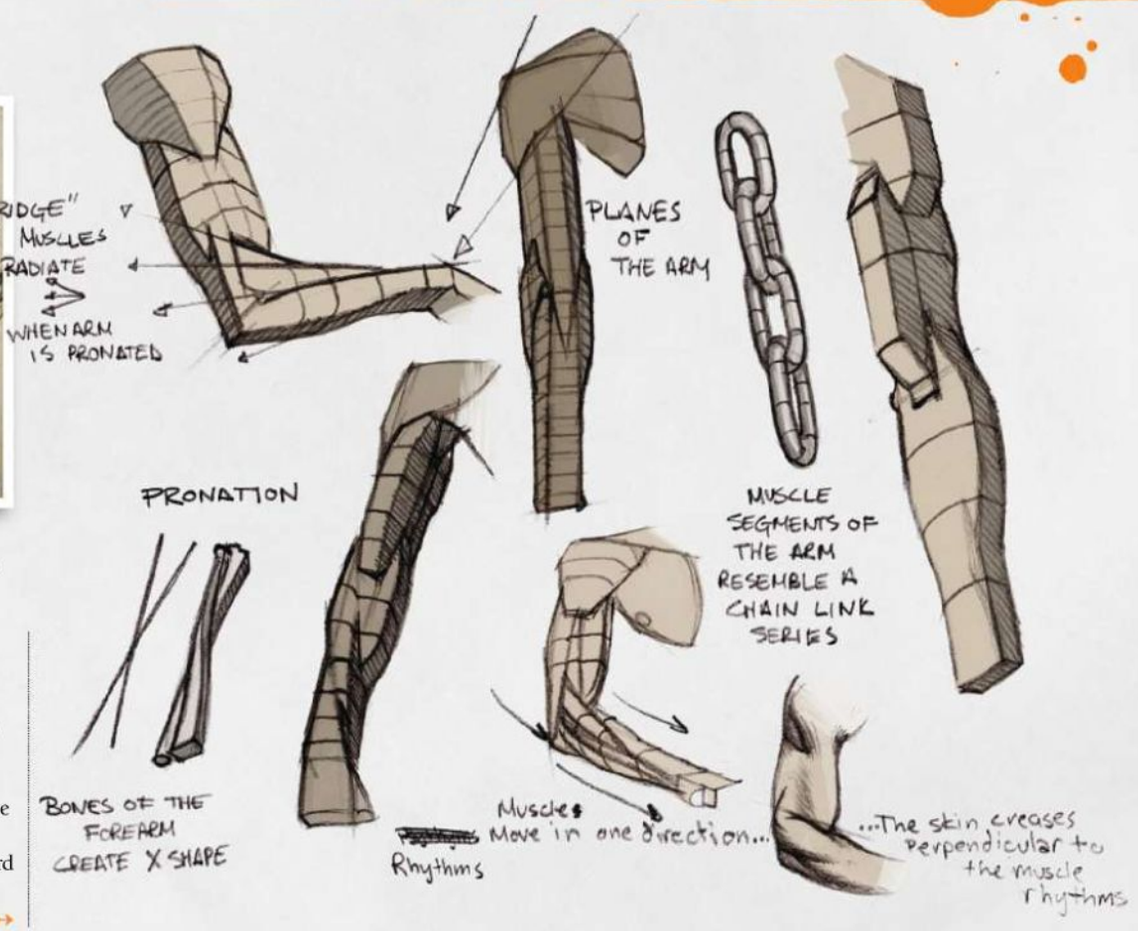


“The muscles of the shoulder function to lift the arm; the biceps and triceps operate the forearm”

MUSCLE SEGMENTS AS LINKS OF A CHAIN



The muscles on this cast are over-developed to emphasise their artistic shape and construction. The slightly rounder forms also lend themselves to more dynamic and fluid rhythm lines.



know and consider when learning how to dictate human anatomy.

A function unique to the arm is the work of the rotator muscles, also known as the ridge or supinator muscles. In opposition to this group of muscles is the pronator teres – a muscle that's on the inside of the arm below the biceps. This group of muscles occupies the upper third of the forearm. The supinators originate about a third of the way down the



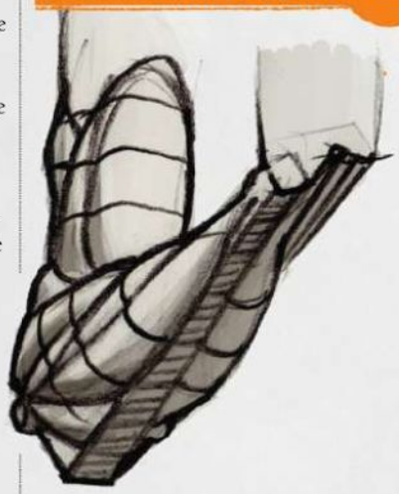
This arm was drawn from a photo of a body-builder, so the muscles are more visible in their construction than in the average person. Weightlifters idealise their bodies, sculpting the muscles to perfection under the the skin, like walking anatomy charts.

humerus and split the biceps and triceps. These muscles rotate the hand left and right, and flex or extend it. Now, contrary to what I see drawn a lot, the ridge muscles don't have a crease in them when the arm is bent. The crease you see is skin folding, not the muscle. Think of the muscle as a cable or a piston – neither of these objects fold over on themselves. Instead, they go slack. As a rule, skin folds perpendicular to muscle fibres, and this is what's taking place in this region. The skin folds, the muscle stays the same shape – just compressed a little bit more.

When the hand is pronated, the ridge muscles cross over from the outside to the inside edge of the arm. The ridge muscles attach just below the thumb so, as a rule of thumb (sorry, couldn't help it), wherever the thumb is, the ridge muscles are pointing to it. The ridge muscles break up the even symmetry between the arm's outside and inside edges.

One way to remember where and how all these muscles work together is to think of the arm as a series of chain links. Each link alternates direction, and that's what the arm does from shoulder to hand. For the arm to fold in on itself, or flex, the muscles have to be positioned to interlock with each other to prevent any conflict of space between all the mechanical parts within the arm mass. Examples on page 45 show this further.

EXAGGERATE THE BONE STRUCTURE



Here is an arm drawn from the underside, with the ulnar crest over-emphasised to show where it is and how it separates the flexor and extensor muscle groups. This bone ridge is over-emphasised to show how the bone travels from the elbow to the wrist.

"Contrary to what I see drawn a lot, the ridge muscles do not have a crease in them. The crease you see is the skin folding, not the muscle"

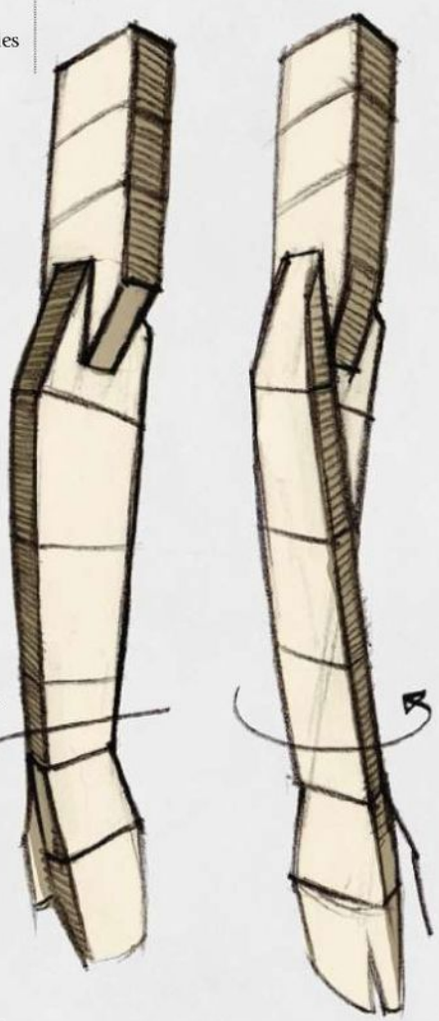
NOTING HOW MUSCLES CHANGE WITH ACTIVITY



Muscles involved in a particular activity will tense – or the muscle form will accentuate – more than the muscles not directly related to the action. The body shouldn't be drawn like a muscle chart, or it won't look convincing. Use the anatomy you learn only to fix problems in a drawing or to simplify complex posing. Use your knowledge in moderation related to the action of the pose – otherwise you should leave it out.

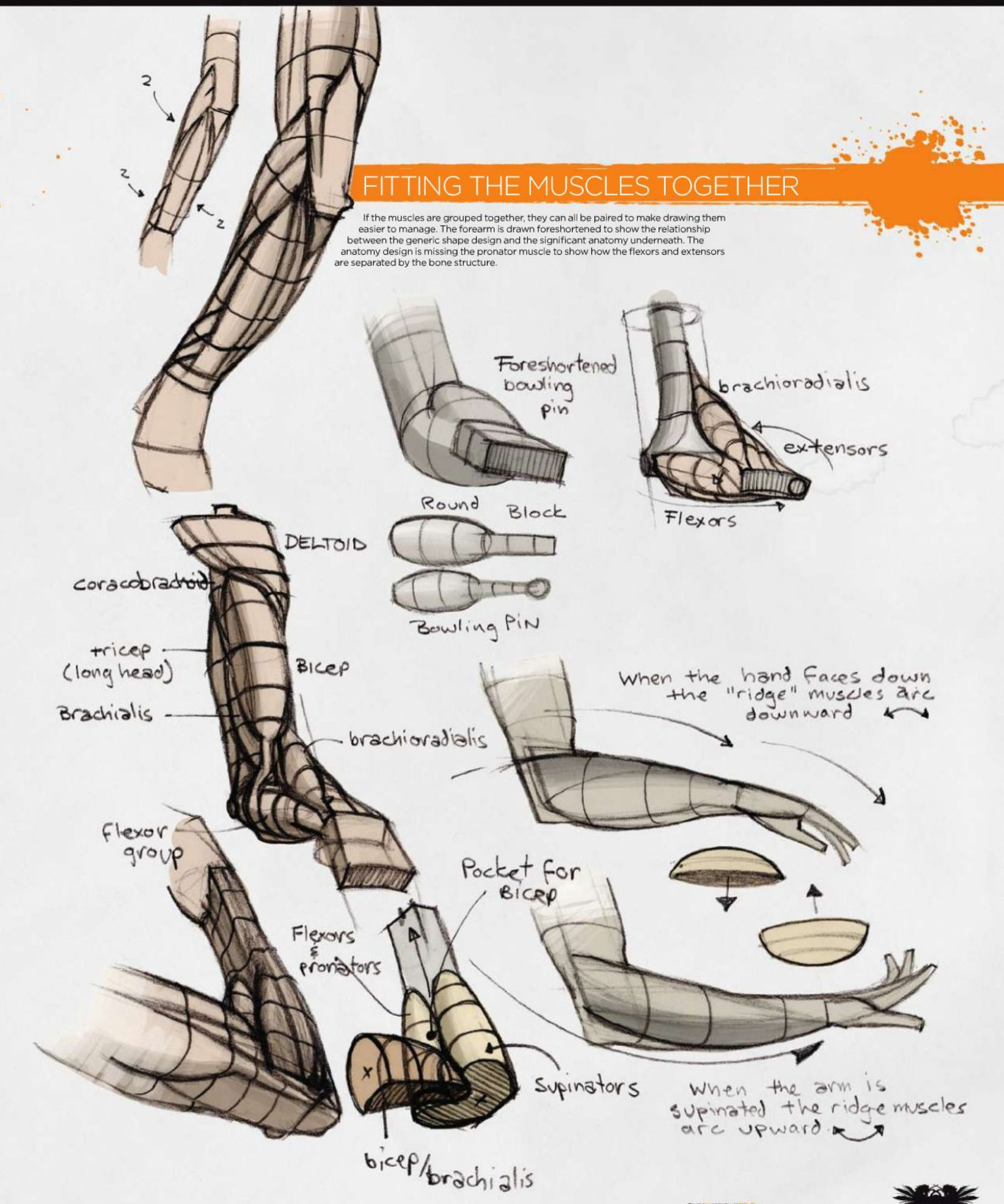
Ridge muscles

The ridge muscles share in the profile of the flexors and the extensors, blending into both sides in the upper third of the forearm. The inside of the arm seats the flexor group – the set of muscles that flexes the hand toward the body. The brachioradialis – the biggest muscle of the group – overlaps onto the inside surface of the arm, the opposing mass to the flexor group and pronator teres. Both these sets of muscles funnel together

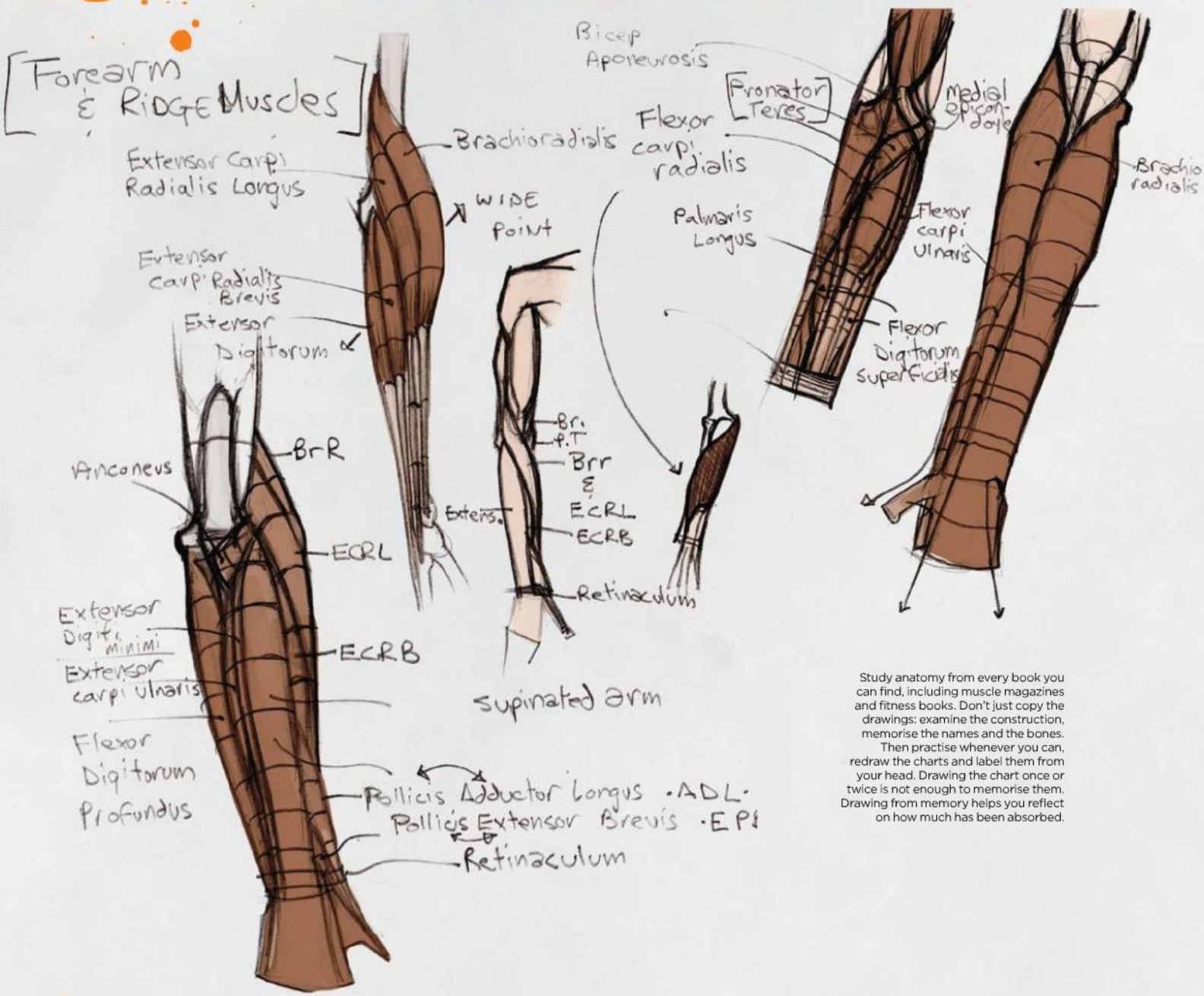


FITTING THE MUSCLES TOGETHER

If the muscles are grouped together, they can all be paired to make drawing them easier to manage. The forearm is drawn foreshortened to show the relationship between the generic shape design and the significant anatomy underneath. The anatomy design is missing the pronator muscle to show how the flexors and extensors are separated by the bone structure.



UNDERSTANDING HOW MUSCLES WORK BENEATH THE SKIN



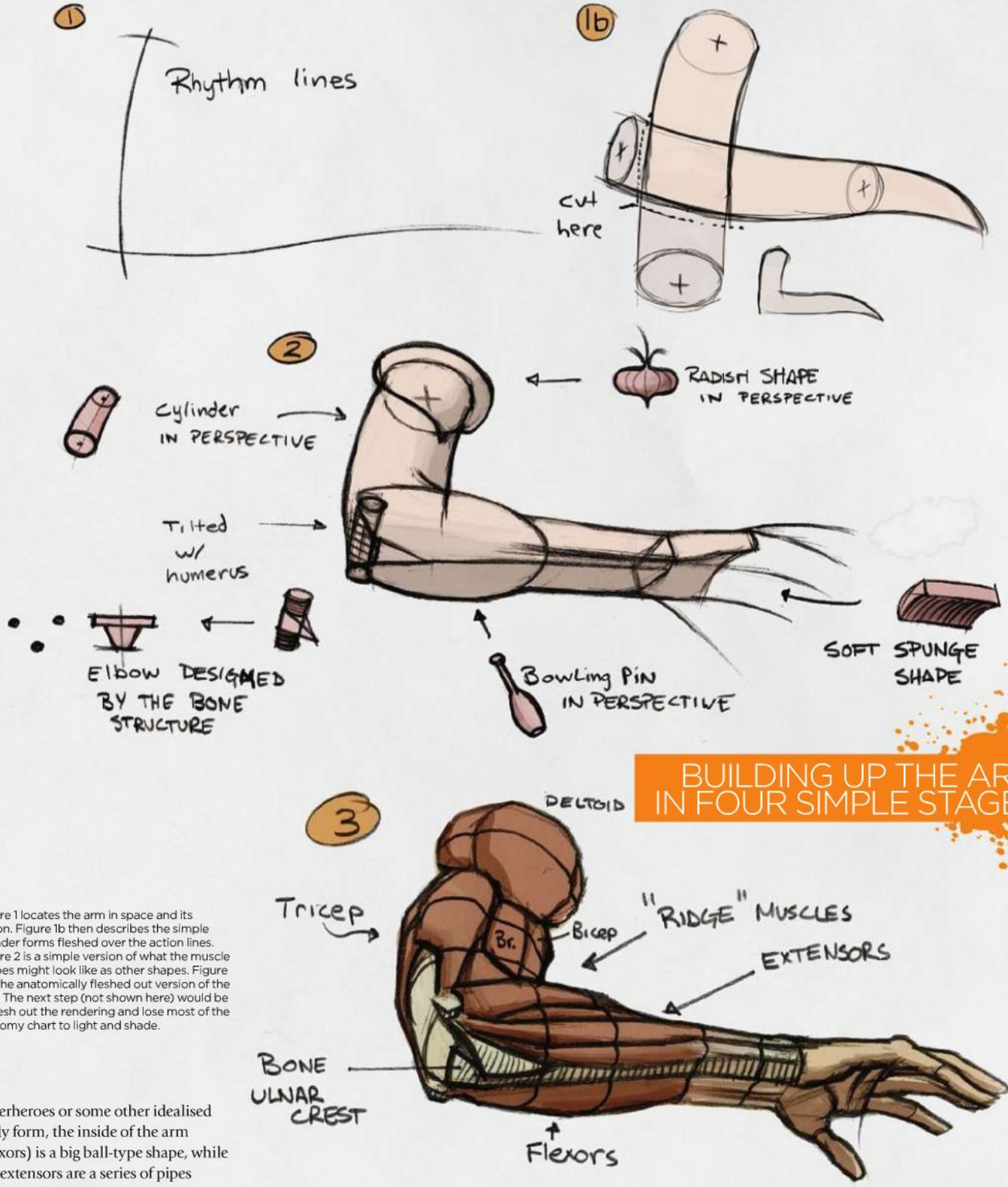
Study anatomy from every book you can find, including muscle magazines and fitness books. Don't just copy the drawings: examine the construction, memorise the names and the bones. Then practise whenever you can, redraw the charts and label them from your head. Drawing the chart once or twice is not enough to memorise them. Drawing from memory helps you reflect on how much has been absorbed.

below the bicep to form the pocket it sits inside of when the arm is bent. The extensor carpi muscles – two more muscles belonging to the ridge group – blend in with the extensors at the elbow and then across the top of the arm. On the other side of the arm, the extensors and flexors are separated by the ulna bone – a split in the muscles known as the ulna crest.

The flexors originate at the elbow on the inside bump (known as the medial epicondyle) of the humerus, the bone that connects the arm to the shoulder (also often known as the upper arm). The muscles cross over the two bones of the forearm – the ulna and radius. Most flexors terminate at the fingertips, while a few terminate in the palm of the hand. There are many layers of flexor muscles. Because the flexing of the hand – for gripping, holding and so on – is its primary functions, more muscles are assigned to assist these actions.

"As flexing, gripping, holding and so on are the primary functions of the hand, more muscles are attributed to assist in these actions"

The extensors originate from the outside bump of the arm (the lateral epicondyle) and cross over the two bones of the forearm, spreading out across the topside of the arm and terminating at the fingertips. These muscles are responsible for opening the hand and pulling back in a halt position – the opposing functions of the flexor group, in other words. The extensor group is the most active of the forearm muscles. If you're drawing



BUILDING UP THE ARM IN FOUR SIMPLE STAGES

Figure 1 locates the arm in space and its action. Figure 1b then describes the simple cylinder forms fleshed over the action lines. Figure 2 is a simple version of what the muscle shapes might look like as other shapes. Figure 3 is the anatomically fleshed out version of the arm. The next step (not shown here) would be to flesh out the rendering and lose most of the anatomy chart to light and shade.

superheroes or some other idealised body form, the inside of the arm (flexors) is a big ball-type shape, while the extensors are a series of pipes radiating from the elbow.

All of the forearm muscle tendons are protected as they pass over the wrist by the retinaculum. This might look like a wrist band, but it attaches separately to both the top and the bottom of the hand. This keeps the tendons from popping out any old way from the arm.

When drawing the arm, you should keep in mind that grouping the muscles together is a better way to begin than drawing the individual shapes. Drawing the figure one muscle at a time is painful and more than likely going to grow into its own unique shape – one that doesn't necessarily resemble a real figure. The visual symbols in the images here should help make some sense of what I mean by this. Study the muscles as one exercise, but learn to consolidate them into groups as another exercise – and as a mantra for your work.

Drawing is not about parts: drawing is about suspension of disbelief, fooling the eye into believing what is seen. We study parts to identify them as a function, only to throw them back into the pile of tools called intuition.



Artist PROFILE



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COUNTRY: US

See more of Ron's work at his website
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On the disc
Find videos and sketches by Ron in the Hands folder inside Human Anatomy

PART 7

DRAWING THE HANDS

Many artists fear drawing this part of the body, but apply the principles you've learned and learn the anatomy, and you'll find the process much easier

Before diving into further drawing advice, let's think about a few concepts to help make the process of drawing a complex shape such as the hand easier. The hand actually has very few muscles in it: its mechanics are guided by the forearm, and its design is based mostly on bone and fatty tissue. The thumb is a distinct shape rooted to the hand mass and should be drawn into the image after the bigger mass has been designed. The four main fingers all radiate toward a common point: the index finger and the pinkie curve toward each other, and the other two fingers fit somewhere between them. The fingers are not parallel with each other, although some actions may make it seem that way. Fingernails and knuckles are details: leave them until last.

It's important to keep steps in their particular order while you absorb the process behind them: whether the drawing you're making is simple or complex, if something falls apart, it's easier to detect where it went wrong in the process. Once you're confident and well-trained in your craft, it's up to you to find your own way of working, and you may well deviate from the academic or school-taught way. This is where you will find your independent style – not in copying others, but in reassessing your working order. Learn it right, then break the rules and tools if you choose, and find your own voice.

Hands can be convincingly drawn interacting with objects or surfaces. I can't stress enough that learning from life is the key to understanding everything you'll ever need to know in art. While art books might give a cool trick for getting a certain look or appearance, solving the problem dimensionally or from every angle will give so much more wisdom and insight. If you can't take an art class, use a mirror. You can use yourself to study from, and you don't have to pay a model fee.



Starting with the overall gesture of a pose helps you design realistic hands.

Getting to grips with the anatomy of hands

Anatomy is important – but more so to a doctor than to an artist. The part of anatomy you should be first concerned with is the shape design, and how can you simplify your thinking and drawing down to the core essence of these shapes.

Finger bones have a particular design to them. The fingers are more than 60 per cent visible bone shapes defining what we see, so understanding the finger bone or knuckle shapes is key in making a more convincing drawing. The finger joints are spool-shaped, depressed slightly in the middles for the tendons of the extensor muscles of the forearm. The metacarpal knuckle – the big one the finger is attached to – is barrel-shaped, not totally spherical, and the tendons that sit in the grooves of the spool shapes on our fingers sit on top of the barrel-shaped knuckle. As research, look at Norman Rockwell's hands in his paintings. He did it better than almost any other illustrator out there.

The hand has a squishy side and a firm side. The squishy side – the palm – is where the majority of muscles of the hand are located. The other visible soft spot is between the thumb and index finger on the hand's back, or dorsal, side. These soft areas are the points on the hand that flex and change shape when active with an object or surface. The hand then conforms to the shape of the object it holds. This last detail can really throw off the best of us at times – unless you remind yourself of a few basic concepts of construction that you can fall back on.

Mechanics of anatomy

Different hands can look like they are different shapes – babies' hands, for example, are chubbier than old people's. But we are built similarly, our hands included. The hand is blocky by nature: it has mass, a top, a bottom, sides, a front and a back. The hand is also circular, as it swivels and pivots in the wrist.

When the fingers are pressed together, the hand looks like a spade. This is where you want to start drawing the hand. Imagining the hand as a soft, blocky form, something akin to a sponge in texture, helps you to remember what you're drawing is a physical object.

BONE SHAPES





HAND HOLDING A BALL



Start with the object to be held (the ball, top). Next, add the arm rhythms and the ball shape for the palm of the hand, then attach the finger wires to the ball mass. These wires should represent the absolute middle profile contour, the middle of the finger mass.

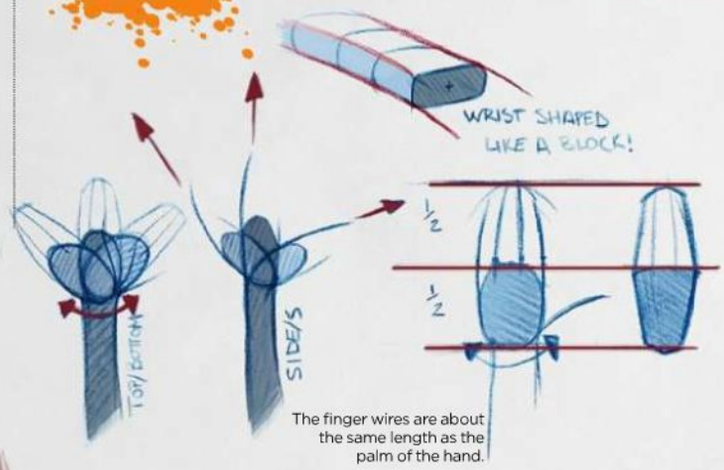
Now flesh out the forms. This means adding dimension to the shapes by giving them planes. To locate the finger segments, find the arcing lines: these segments arc more than 90 per cent of the time. The arcs determine the relationship of each particular band of knuckles – proximal, middle or distal – from finger to finger. Knuckles are knobby; either round or blocky. However, you may find that stylising will change this blocky appearance.

If you can't remember the anatomy, remember the concepts: they'll get you through any doubts you have about what you're drawing.

The fingers are roughly the same length as the hand mass. Remembering this is a good check-and-balance to make sure your drawing's proportions are right, even when the fingers are folded and the hand is foreshortened. Proportions have a way of being understood even when obscured.

The hand is attached to the arm, and the arm is an extension of the torso, so starting with an overall gesture of the pose ensures that the design you pick for the final hand is correct. The hand position is relative to the rotation of the arm (or its pronation or supination). The sketch hopefully solves the dilemma of how to start the design of the hand. I sometimes think of designing the hand in action by drawing the object first. Once I know where the object is, relative to the pose of my character, I can work out the rest of the action.

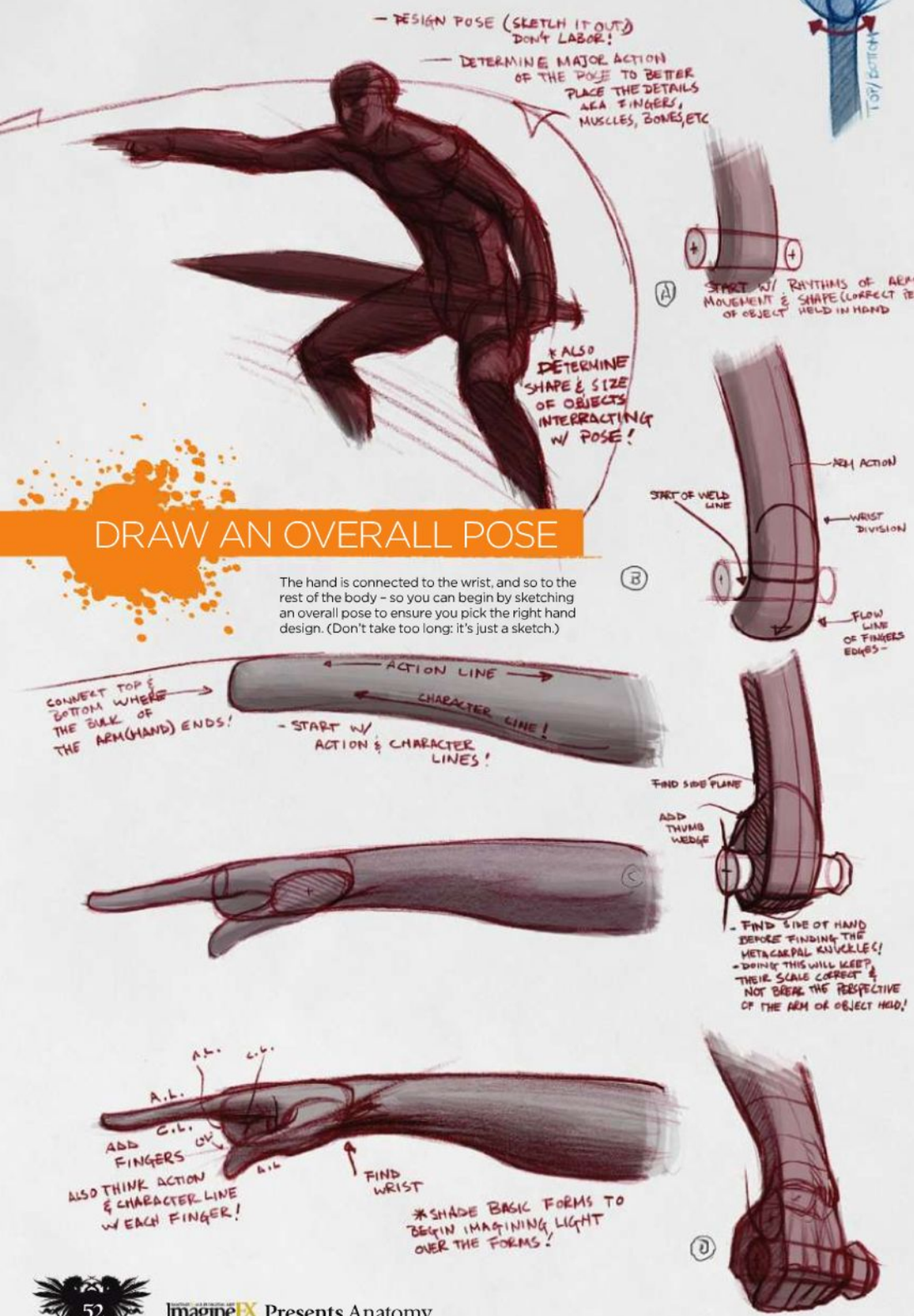
WIRE HAND DESIGNS



The finger wires are about the same length as the palm of the hand.

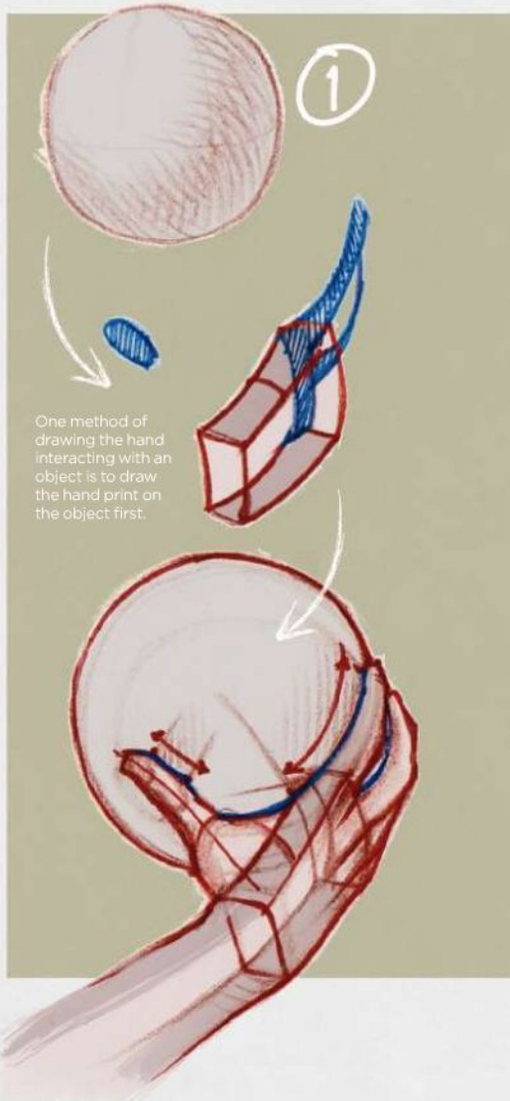
DRAW AN OVERALL POSE

The hand is connected to the wrist, and so to the rest of the body – so you can begin by sketching an overall pose to ensure you pick the right hand design. (Don't take too long: it's just a sketch.)

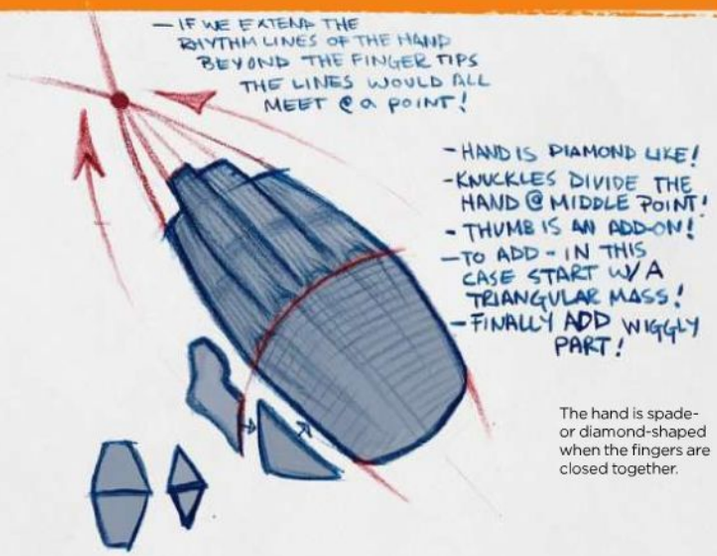


Interactive hands

Another way of establishing the hand's interaction with an object would be to draw the object, draw a hand print on the object so you know where to define the details, then build up off of the hand print all the



One method of drawing the hand interacting with an object is to draw the hand print on the object first.



The hand is spade- or diamond-shaped when the fingers are closed together.

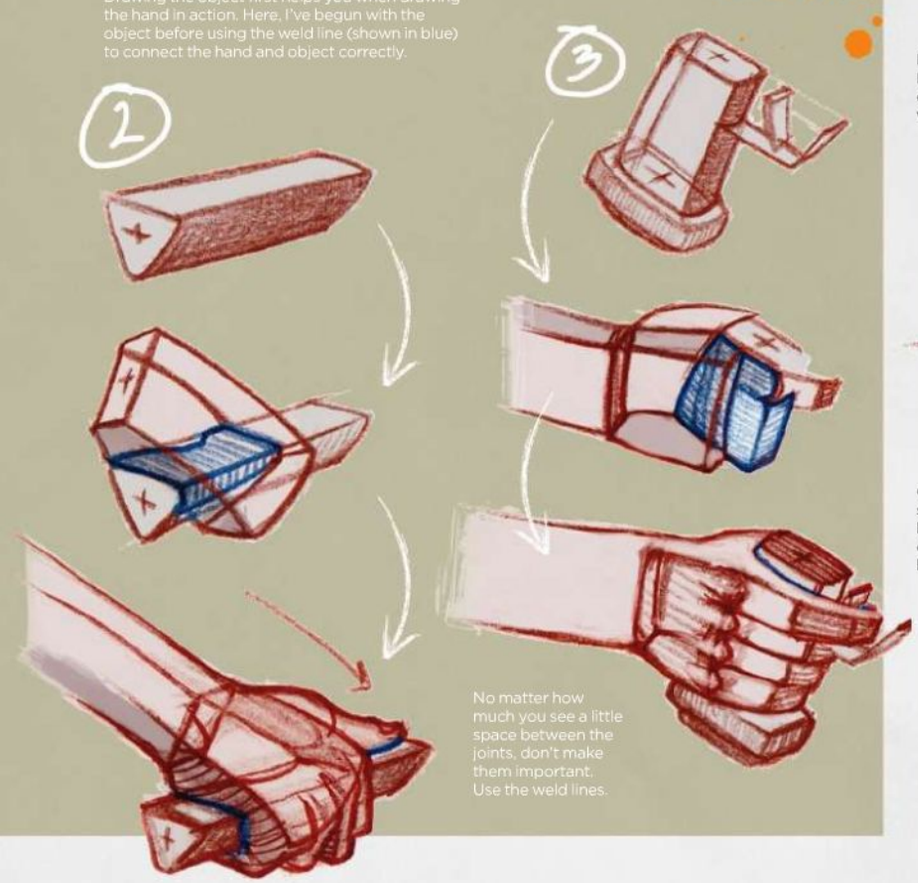
formal shapes, the hand block, the finger masses, and so on.

The line that shows the connection with the object is the weld line. Press it firmly against the object, showing off the object's form more than the hand. No matter how much you see a little space between the joints, don't make them important. Make the weld line show off the action.

Draw details – fingernails, knuckles, wrinkles – last. They sit better on the fingers when they are well designed dimensionally. Before this, render the surfaces: find the shadow patterns, and use planes to chart values across the surfaces. This is what it means to render a form; making a stronger visible shape, not adding details.

DRAWING GRIPPING HANDS

Drawing the object first helps you when drawing the hand in action. Here, I've begun with the object before using the weld line (shown in blue) to connect the hand and object correctly.

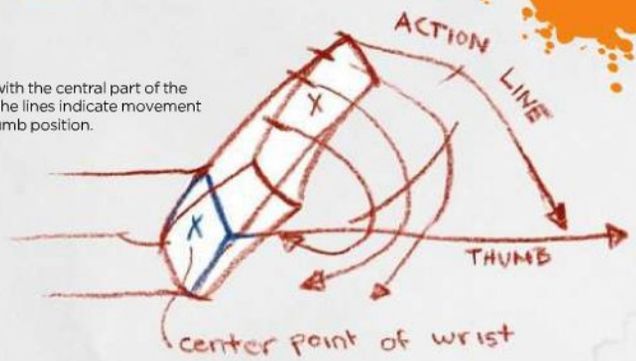


No matter how much you see a little space between the joints, don't make them important. Use the weld lines.

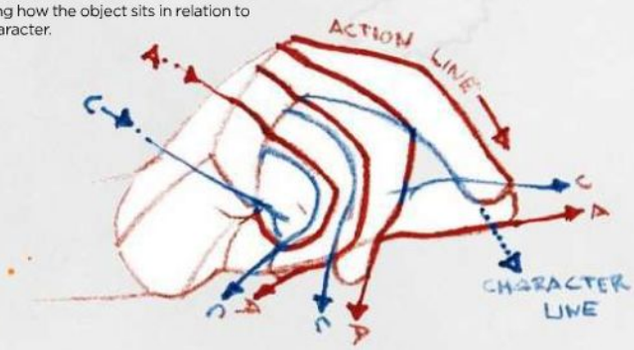
"Details sit better on the fingers when they are well designed dimensionally. Draw them last"

CONSTRUCTING A HAND

Begin with the central part of the hand. The lines indicate movement and thumb position.



The different-coloured lines here indicate the gesture of the hand and the character, showing how the object sits in relation to the character.



Next, it's time to sub-divide surfaces. Here, I'm using the plane structure method to chart values and tones across the surfaces, working up from flat values.



Only when all of this is done do I begin to shade and detail the hand. Once I have the hand shape rendered, I can then add details such as creases, fingernails and knuckles to make it look realistic.





The head is one of the most important parts of the body to draw, so practise as much as you can.

PART 8

DRAWING THE HEAD

Break the skull and features into simple forms to get the proportions right

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When drawing the human body, one thing that's essential to perfect is your method for drawing the head. The skull is the traditional academic measuring stick of the human form: formulae have been created that enable artists to use the skull as a tool from which to draw the rest of the figure with confidence, helping you to maintain the correct proportions and scale for the figure as a whole.

Here, I'm going to talk you through my basic process for creating well-drawn heads. The theory is important and can offer a certain degree of freedom from reference – but, as I've said before, nothing beats hands-on practice. Get a friend or family member to model for you at every opportunity, hire a model or, with the help of a mirror or photos, draw yourself. Theory alone cannot give you enough experience as an artist to work through every problem you'll encounter in your career.



Shape up: basic head forms

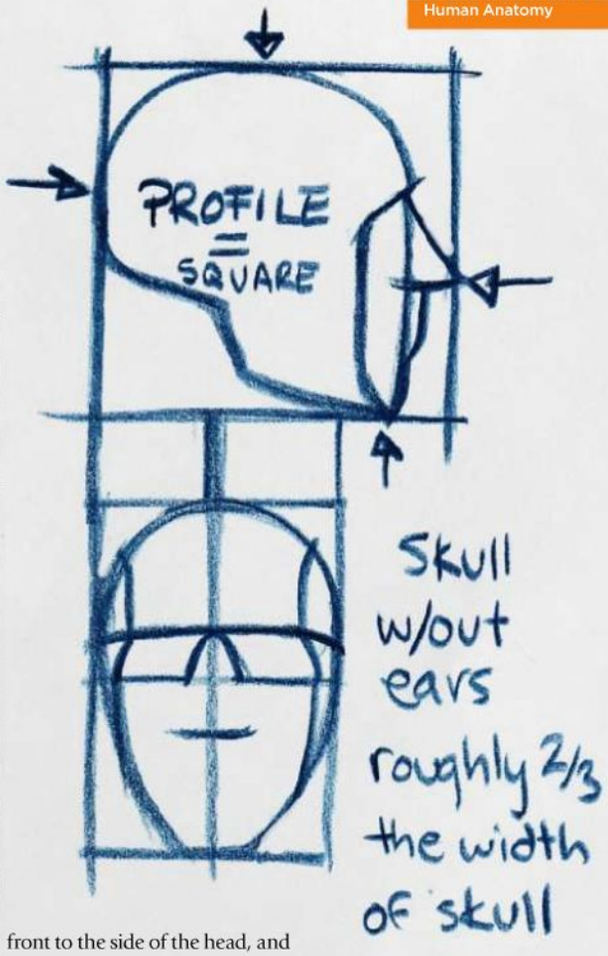
Put your head in a box to ensure that you've got the correct dimensions

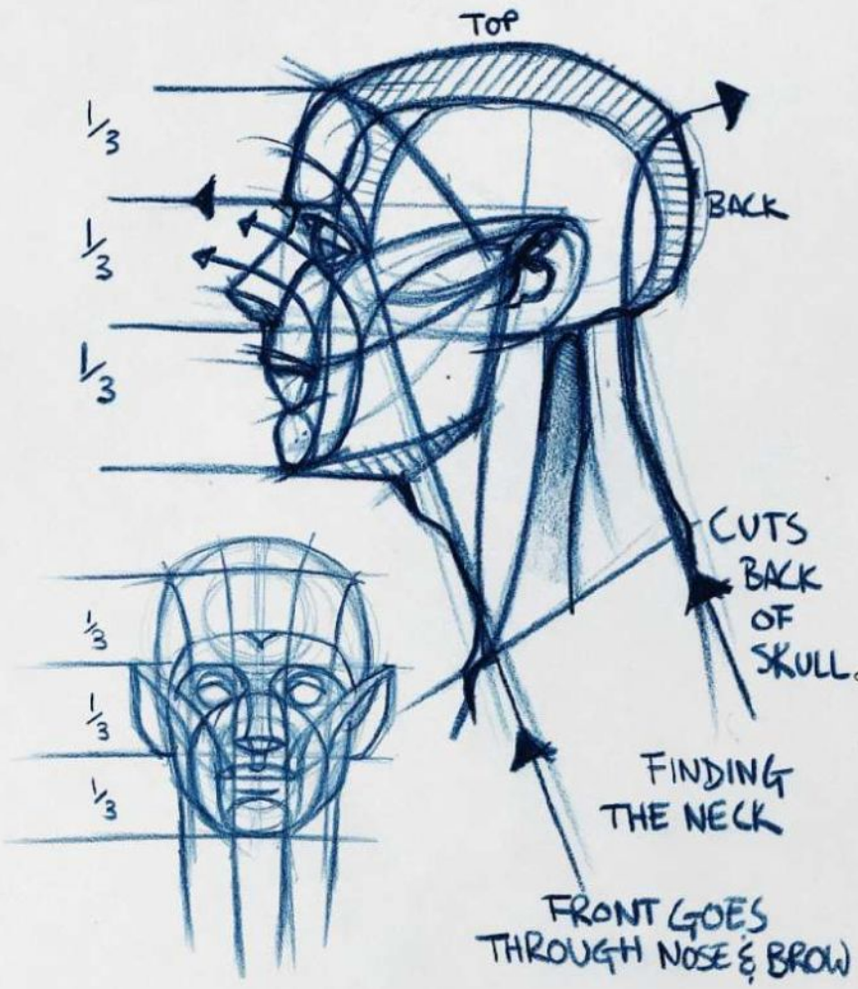
Below is my sketch of a head in front and side profiles, split into three roughly even sections. Measuring the skull from the side (including the nose) it fits roughly into a square box (as you can see to the right). From the front but excluding the ears, it's about two-thirds the width of that box at its widest point.

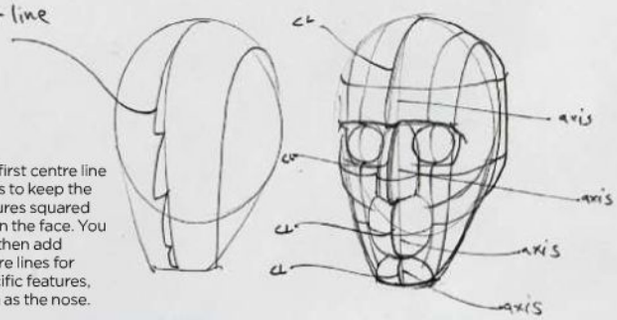
When children draw a head, they usually start with a vaguely oval or 'egg' shape. The head is really neither an oval nor a block, of course, but thinking about both while designing the skull will help you achieve realistic dimensions.

So, like a child, begin with an oval. Draw a line to find the inside corner of the face, or the change of plane from the front to the side. This is usually where portraits fall apart: without a three-quarter line, the features drift from the front to the side of the head, and proportion, direction of gaze and symmetry all fall out of alignment. Now draw a centre line. This helps keep the features squared up on the face plane and is especially necessary when the head is tipped or tilted.

Draw perpendicular lines attached to the top and bottom of the centre line

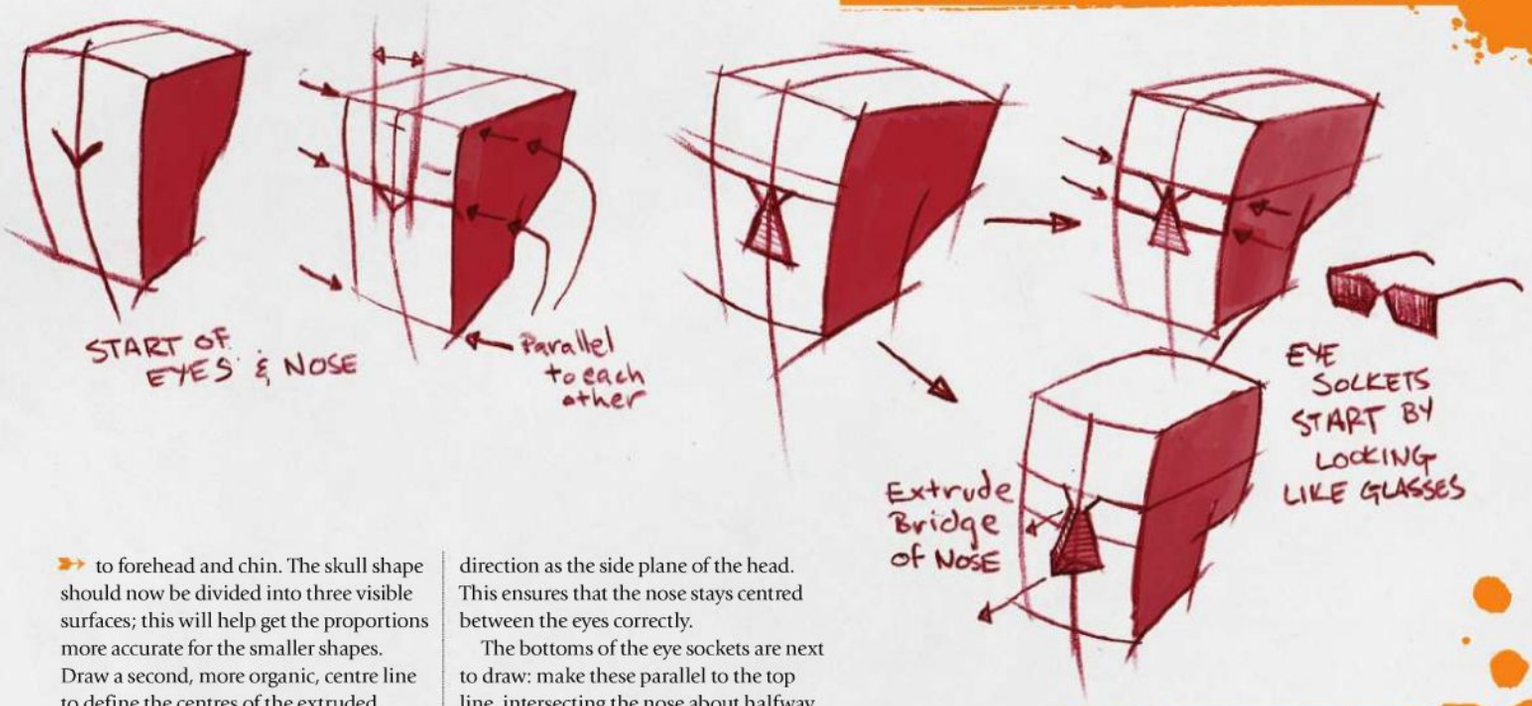






The first centre line helps to keep the features squared up on the face. You can then add centre lines for specific features, such as the nose.

THE NOSE AND EYE SOCKETS



to forehead and chin. The skull shape should now be divided into three visible surfaces; this will help get the proportions more accurate for the smaller shapes. Draw a second, more organic, centre line to define the centres of the extruded features – the lifted brow, nose, tooth cylinder and chin.

The first feature to start with is the split between the eyes: this is known as the glabella. Typically, it's a wedge shape between the eyebrows, just above the bridge of the nose. I choose to begin here because the glabella establishes an overall width for all the rest of the features. Next, attach a horizontal line to the top of the glabella wedge to establish the tilt of the eye sockets in relation to the centre line (a perpendicular relationship).

Drawing the nose

Drawing the nose is tricky, but good organisation will make it a whole lot easier. Start with a tall triangle, flat against the face plane as though you've shaved off the nose. The top of the triangle overlaps the glabella and creates the interior line of the eye sockets. Knowing the perspective of the head makes it easy to draw the perspective of the nose. Extrude the bridge in the same direction as the side plane of the head. This ensures that the nose stays centred between the eyes correctly.

The bottoms of the eye sockets are next to draw: make these parallel to the top line, intersecting the nose about halfway down its length. Extend the top line around to the side planes, keeping it at the same elevation to the top of the head.

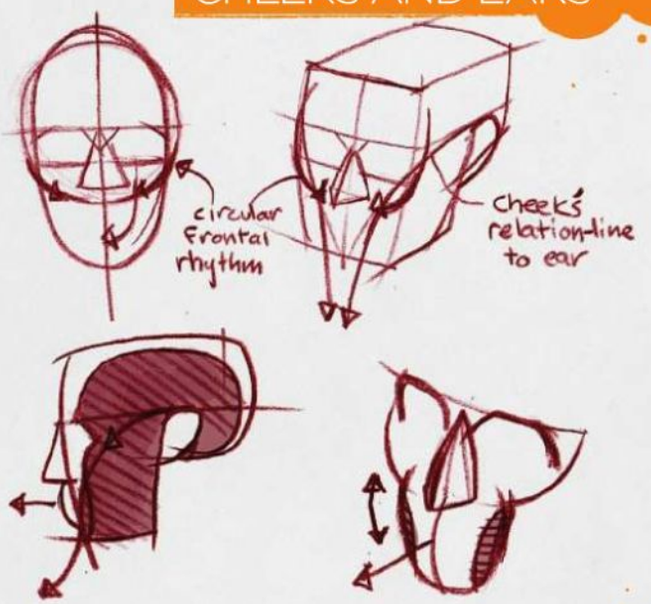
The eye sockets should look somewhat like sunglasses in their design. Take the bottom line and do the same thing you did with the top one. Both of these lines frame where the ear should be placed on the side plane in correct elevation to the top and bottom of the head.

Cheeks and teeth

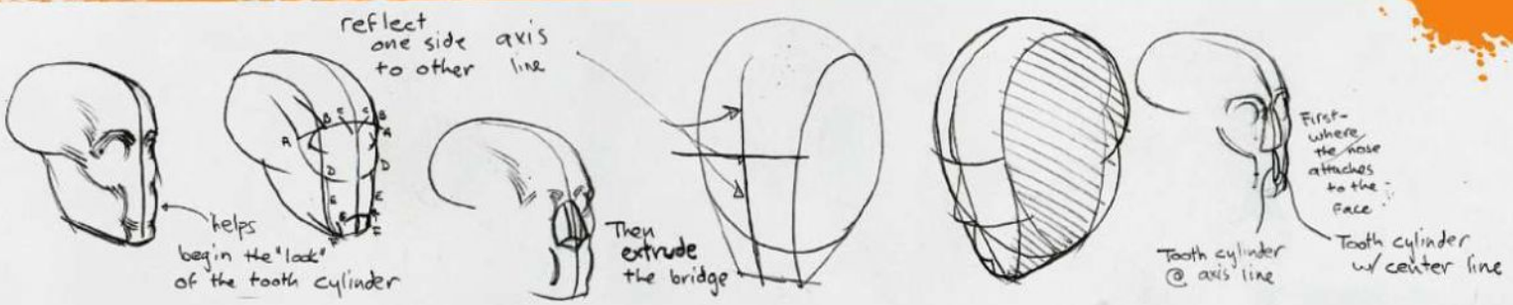
The cheeks and tooth cylinder can be drawn together in a rhythm, starting with an arc that crosses through the face plane from cheek to cheek. From directly in front, this rhythm can be drawn as a circle; more work is needed from the side view, since the cheek shares its rhythm with both the front and side planes. The ears are used to help design the cheeks (see the diagram to the right).

The tooth cylinder is connected to this cheek and drops down toward the chin, arcing across the centre line and up the

CHEEKS AND EARS



THE TOOTH CYLINDER RELATIVE TO THE NOSE



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other side, leaving enough space for the ball of the chin.

The mouth extends from the face like a mound. Often, it is more cylindrical than rounded, which is why it's commonly known as the tooth cylinder in life-drawing manuals.

the head as a basic shape, and attach the face like a mask, with the hairline framing the upper half of the mask shape.

It's just as important to see the hairline as a geometric shape as it is any of the other features. Visualising the hairline as part of the facemask can help attach the

"When drawing anything organic, it's best to think about the shapes with edges and corners first. The top of the skull can be drawn as a block"

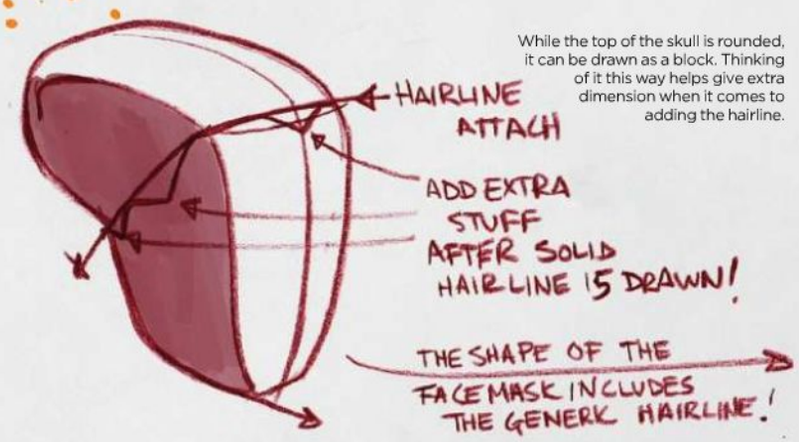
The top of the skull, while rounded, can actually be drawn as a block. When drawing the hair on to the head, thinking about the skull as a block can add extra dimension to the hair mass.

The best way to draw the hair is to start with the hairline. I do this as follows (refer to my sketch below to help): draw

hair correctly to the skull and keep everything lined up around the head.

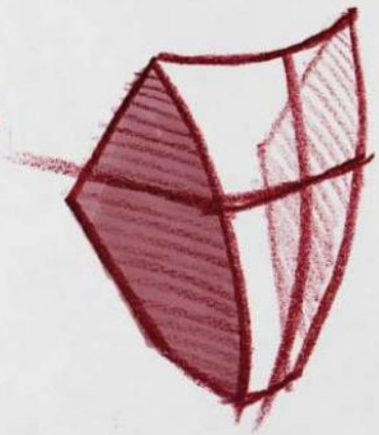
When drawing anything organic, think about the shapes with edges and corners first. The perspective of a form is found much more easily if there are points to use as landmarks, and a straightish line connecting them.

ADDING THE HAIRLINE, AND USING BLOCK SHAPES FOR DIMENSION



While the top of the skull is rounded, it can be drawn as a block. Thinking of it this way helps give extra dimension when it comes to adding the hairline.





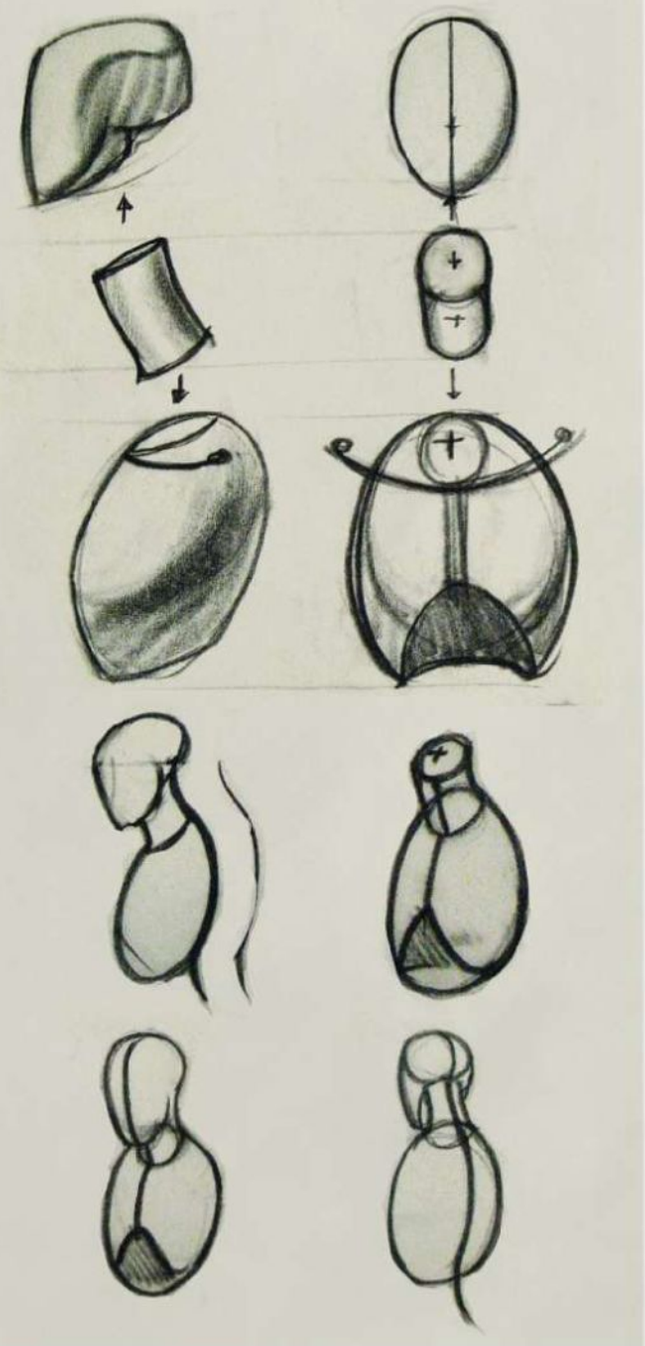
It's important to see the hairline as a geometric shape. Visualise it as part of the facemask (above) to help you position it correctly on the skull.

HEAD AND SHOULDERS

Unless you're drawing a disembodied head, there will come a time when you'll want to attach it to the rest of the body, which means adding the neck, ribcage and shoulders.

Attaching the neck and shoulders to the head can be a tricky business. If you're drawing the head first, it's at this point that the rest of the pose is about to be drawn. This connection will help you to develop and define the shapes of that pose, ensuring that it fits correctly with the head you've already got.

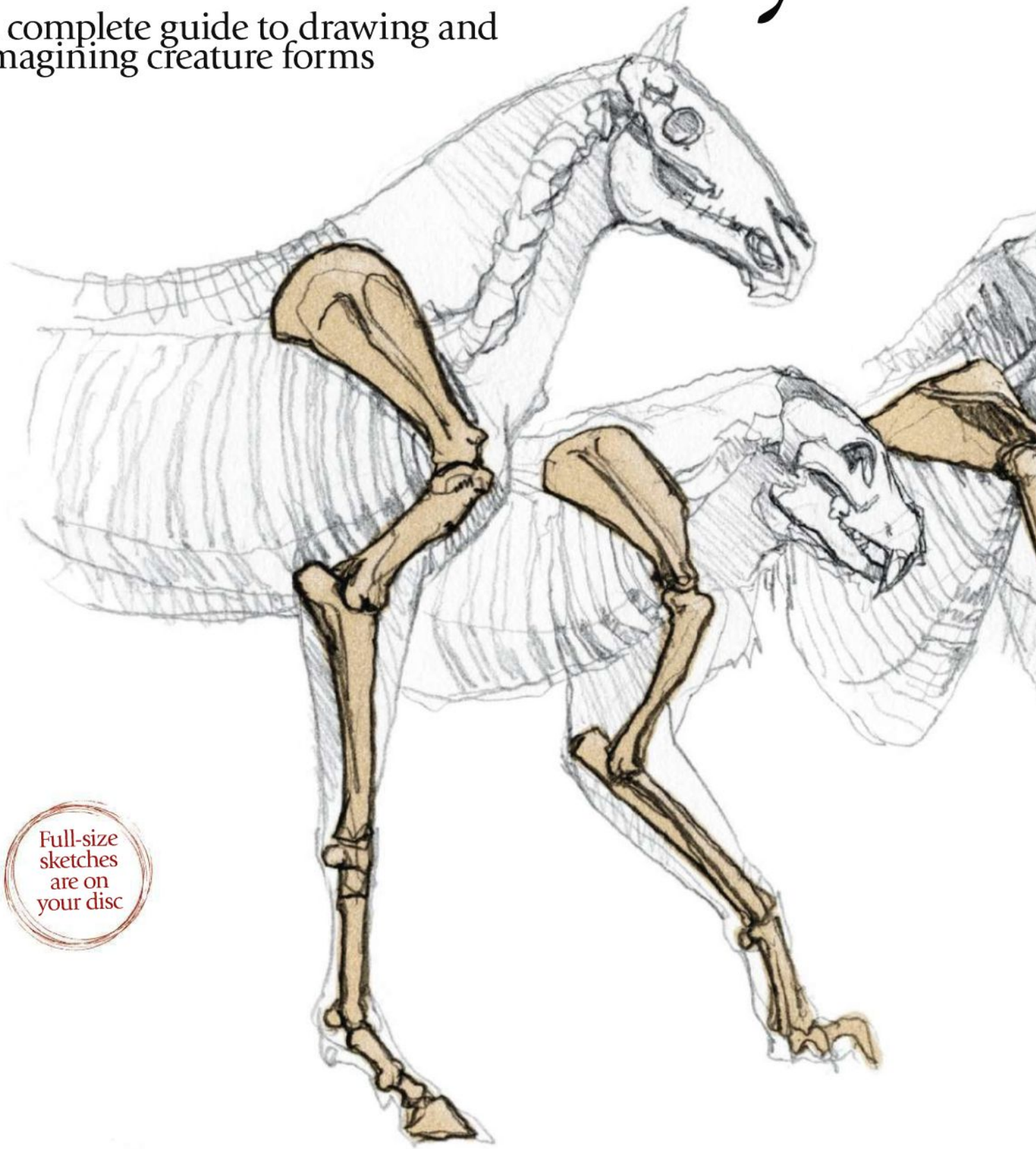
Attach the head (ball) to the neck (cylinder), then attach the cylinder to the ribcage (ball). The shoulders float over the ribcage. The only point where two bones connect together is at the pit of the neck, where the clavicle connects to the ribcage. Therefore, the ribcage is the most important structure after the head and neck.



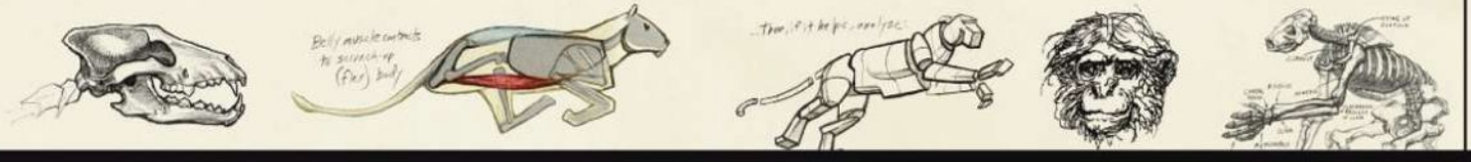


Animal anatomy

A complete guide to drawing and imagining creature forms



Full-size sketches are on your disc

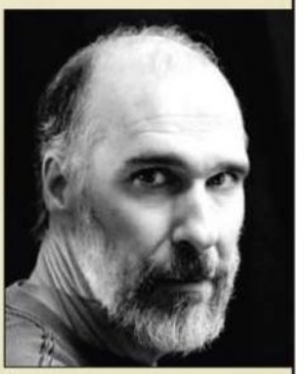


> **Whether you draw or paint, knowledge of anatomy and form will enable you to get your ideas into images**
>
> Marshall Vandruff on animals, page 60



Your animal anatomy expert

Marshall Vandruff is a freelance illustrator who's worked for Warner Bros, Hanna-Barbera and Dark Horse among many others. Marshall has trained professional artists and students in Southern California since 1984.
www.marshallart.com



Workshops

Explore animals in six parts



60 Basic forms
Begin your exploration of creature anatomy by seeing the shapes beneath the skin and fur



66 The torso
Find out how the core of the animal body operates and how you can use it to bring life to your animal art



72 The hind legs
Explore the real-wheel drive of animals, and how this part of the body can propel your art forward



78 The forelegs
Use your observation, skills and knowledge to build the pillars of balance and grip in animals



84 The neck and head
Discover what part of the animal body tells you about the creature – and the traits all animals share



90 Animal faces
Find out what animal faces have in common with human faces, and the crucial ways in which they differ

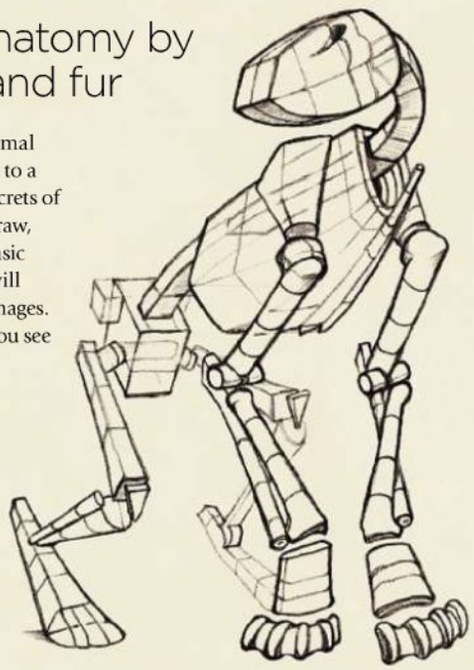
PART 1

BASIC FORMS



Begin your exploration of creature anatomy by seeing the shapes beneath the skin and fur

Animals are something I love to draw, especially from imagination. For years, I had no idea how animators, comic-book artists and old masters could not only draw animals without copying what they saw, but actually make animals look thicker, stronger, funnier and more alive than anything they could see. Then I learned that there are secrets to animal anatomy – old secrets, well-known to a few. These workshops reveal the secrets of inventing animals. Whether you draw, paint, sculpt, model or animate, basic knowledge of anatomy and form will enable you to get your ideas into images. When you can create any animal you see in your mind's eye, that's mastery.

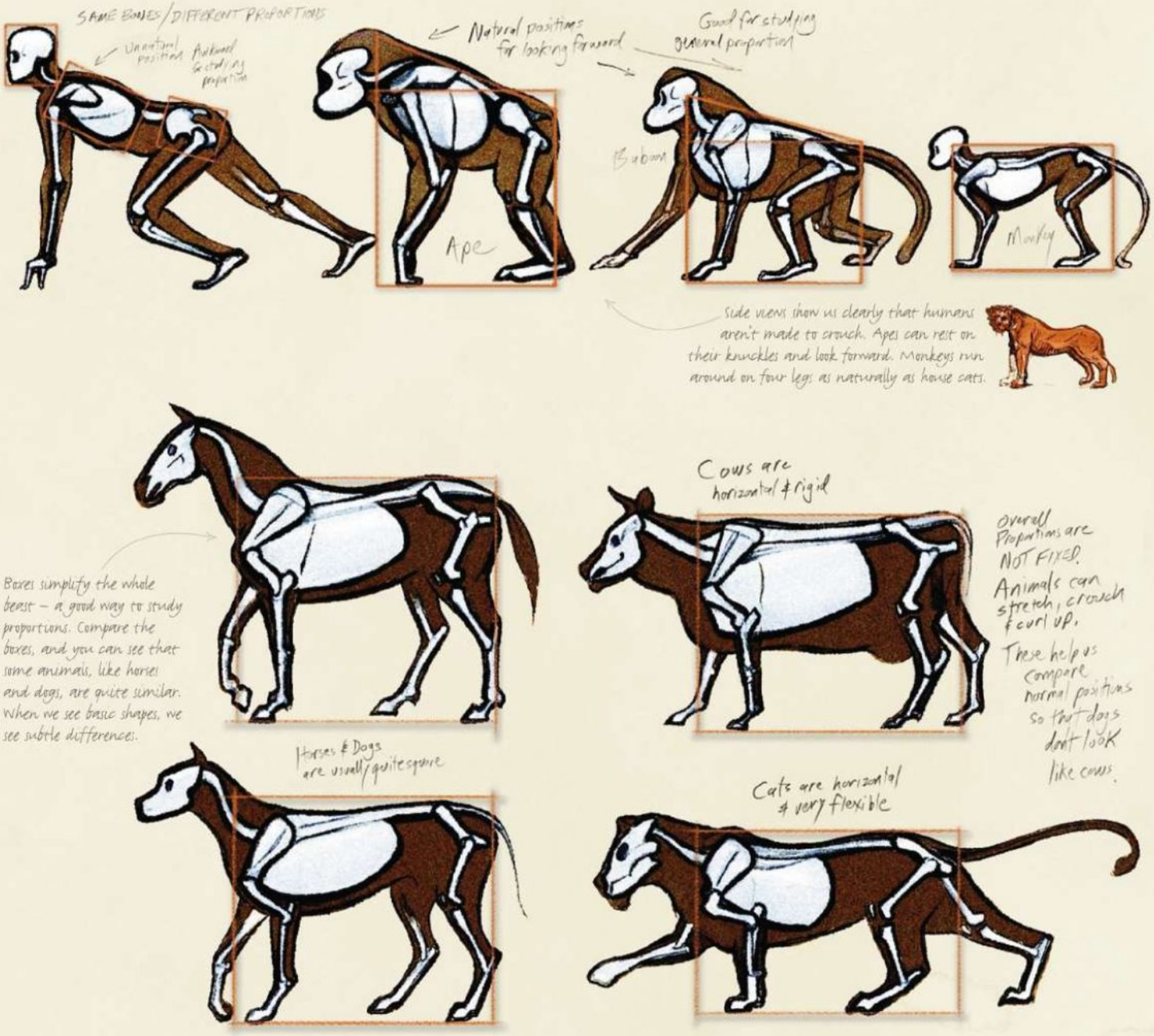


I drew the skeleton from real American Lion bones at the Page Museum in Los Angeles. The form analysis (right) is an exercise in applying perspective to anatomy. The pencil rendering of the head is a speculation of how the fleshed creature may have looked.





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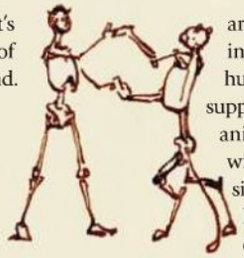


PROPORTIONS

UNDERSTANDING THE SIMILARITIES AND DIFFERENCES WITHIN BONE GROUPS CAN LEAD TO GREATER ANATOMICAL AWARENESS...

Mammals, reptiles and birds share most of the same bones and muscles, but at different sizes and ratios. That's why you should study proportion. When you look at two-legged beasts (bipeds) like humans, or other plantigrades that plant feet on the ground, you can begin with front views. But creatures who run around on four legs (quadrupeds) don't take to being studied from the front. It's like trying to judge the length of a ship by looking down one end.

Proportions reveal what an animal does. Our bones show that people are designed to stand up: we have long legs, shallow ribcages, shoulder blades on our backs, and arms that are good for playing instruments, drawing and hugging, but not made to support our weight. Four-legged animals have deep ribcages with shoulder blades on the sides, and arms that act as legs. Different functions, different forms.



HOMEWORK ASSIGNMENT

Master proportion

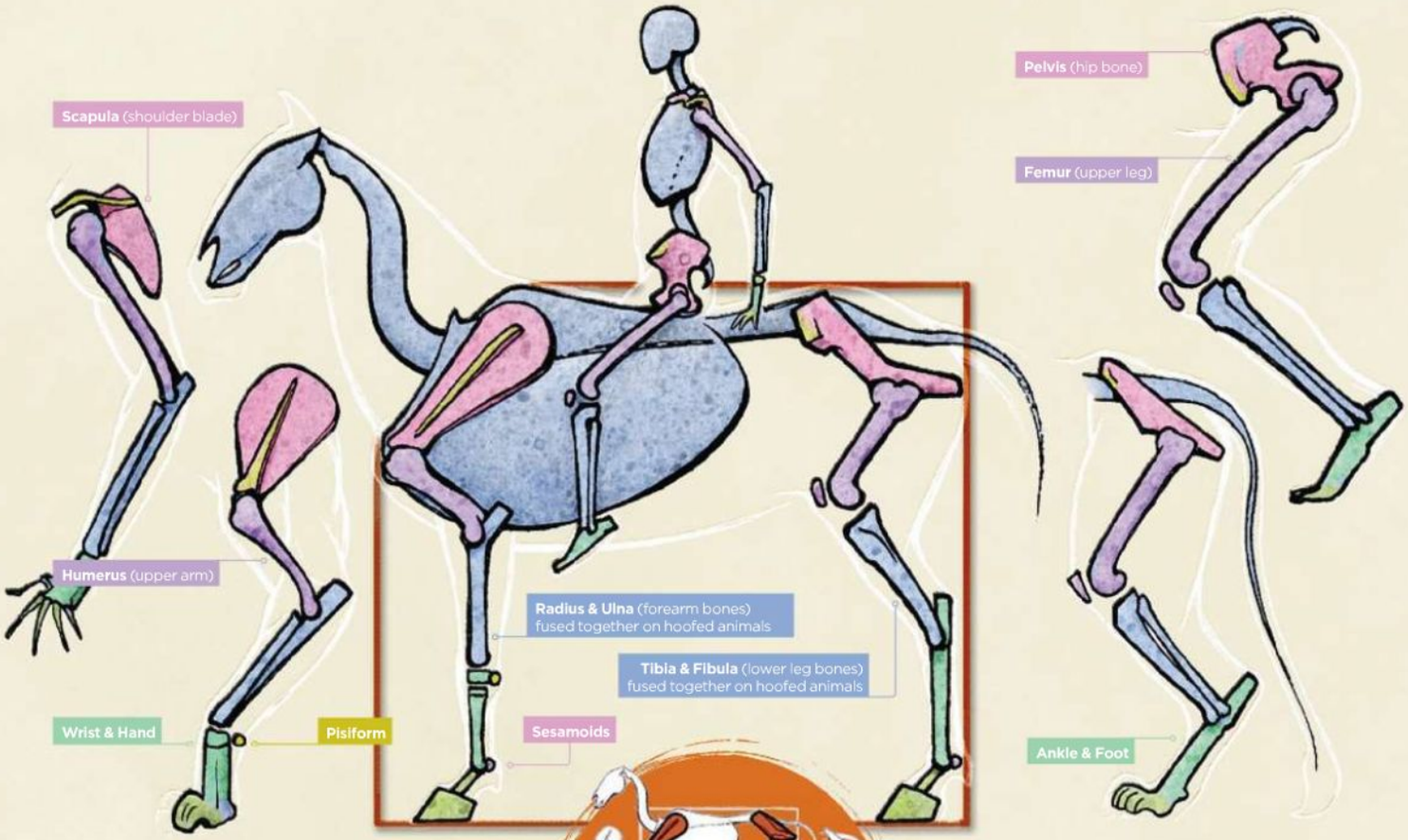
Diagram an animal from the side. Measure a box that fits the big parts of the torso: this trains you to see big things first. By reducing heads, hind legs and ribcages into boxes, triangles and eggs, you learn to see complex components as simple shapes. That's the underlying secret to mastering proportion.

BONES AS FOUNDATION

BONES DON'T BEND OR STRETCH – THEY STAY AS CONSTANT AS ROCK. SO STUDY THEM FIRST...

Over-complicated anatomical charts full of ribs and gnarls can confuse the more delicate learner students. The diagrams below leave out the more exacting details and hidden bumps, and simplify the hard-surface architecture that artists can use. There's plenty of time to get into the details later.

For now, compare the colour coding on the diagrams to see the analogies between human and animal bones. They are often quite striking.



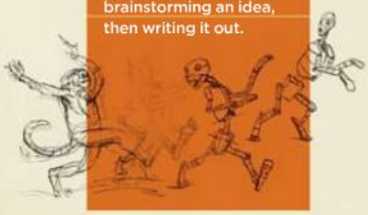


Notice the similarities between a quatroped's shoulders and hips – they are practically mirrored.

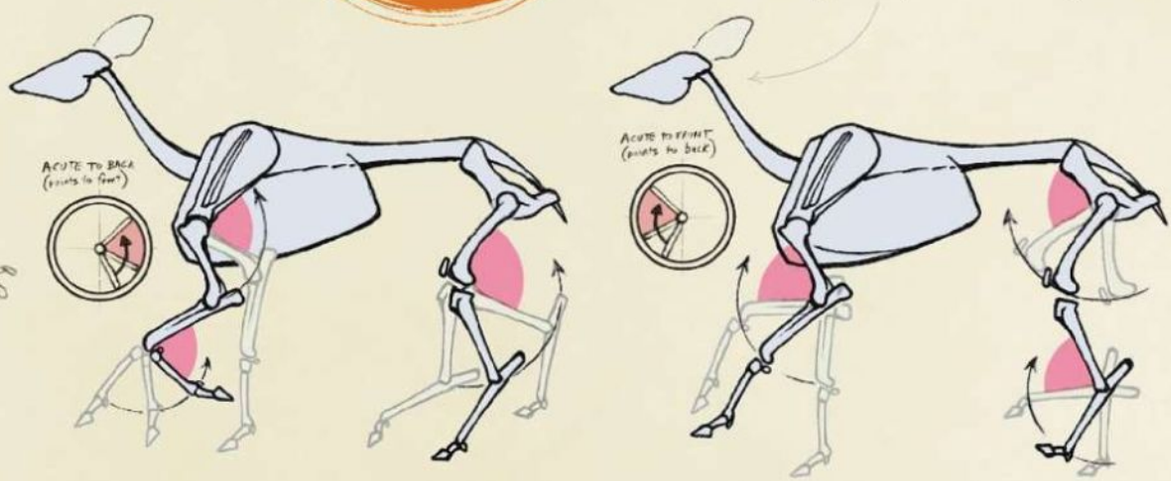
HOMEWORK ASSIGNMENT

Draw stick-figure animals

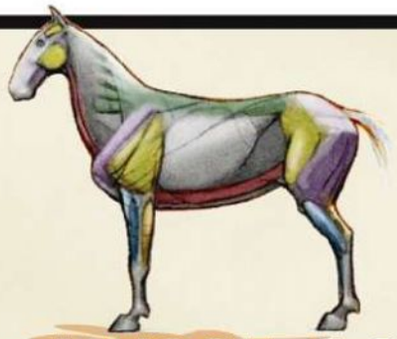
Draw skeletons as stick figures. Keep them simple: details and textures don't help, length and positions do. Artists often do best when they begin with loose lines to get proportions and rhythms right – like an author brainstorming an idea, then writing it out.



Bones may not change shape, but they do change positions. These two sets of angles show the range of motion you can expect to see in a living animal.



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MUSCLES & TENDONS

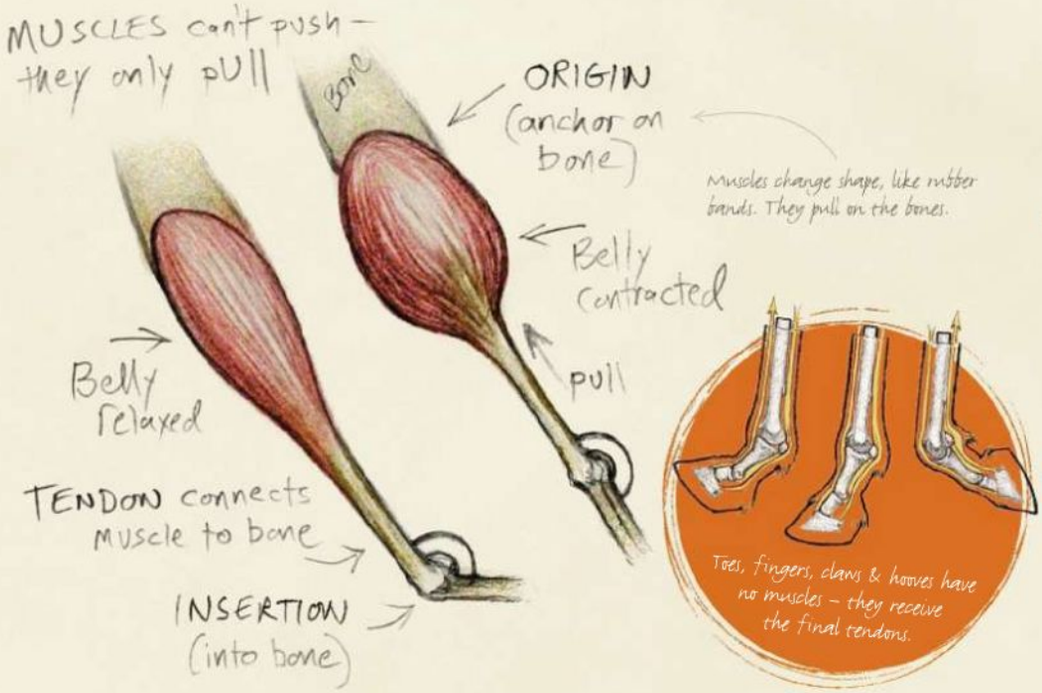
HOW THEY ATTACH, AND HOW THEY RELATE TO EACH OTHER...

Muscle charts are more confusing than bone charts – not just because there are more muscles, but because muscles are layered. Surface muscles can be so thin that they disappear on a fleshed creature, while buried-deep muscles can show as large bumps on the surface.

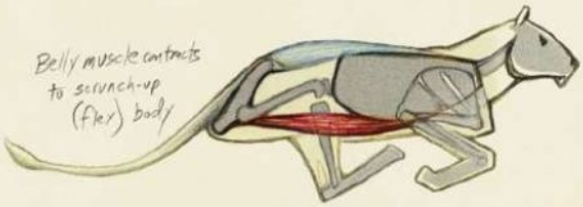
Let's start proceedings with some general observations:

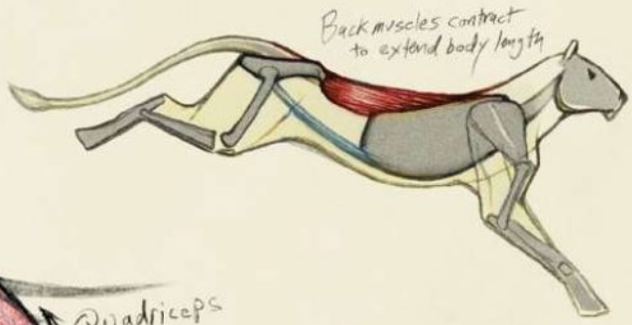
- Muscles anchor close to the trunk (proximally), and insert distant from the trunk (distally) to move the limbs.
- Muscles are thick near the trunk, lean as they move away. On hoofed animals, the distal limbs look like shrink-wrapped bones.
- Muscles can be simplified by grouping them. Several extensors with hard-to-remember Latin names can make a single easy-to-remember egg shape.
- Muscles work in pairs that pull against each other, shown in the illustrations using complementary colours.

We'll study specifics later. First, look at these images to see how they work.





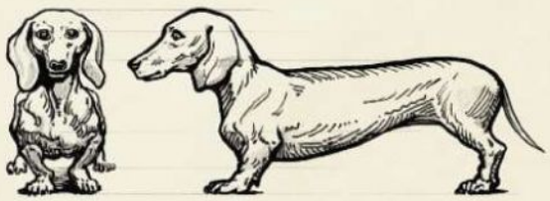


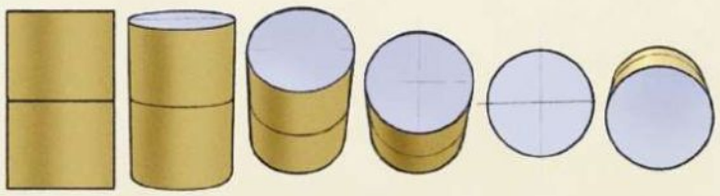




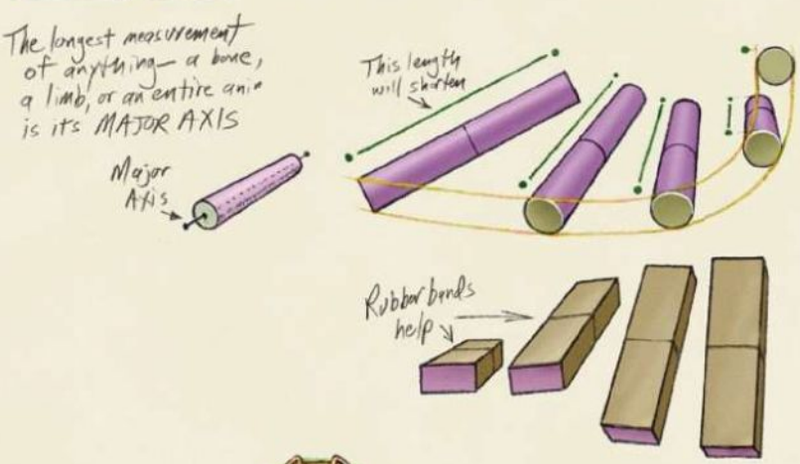
FORESHORTENING

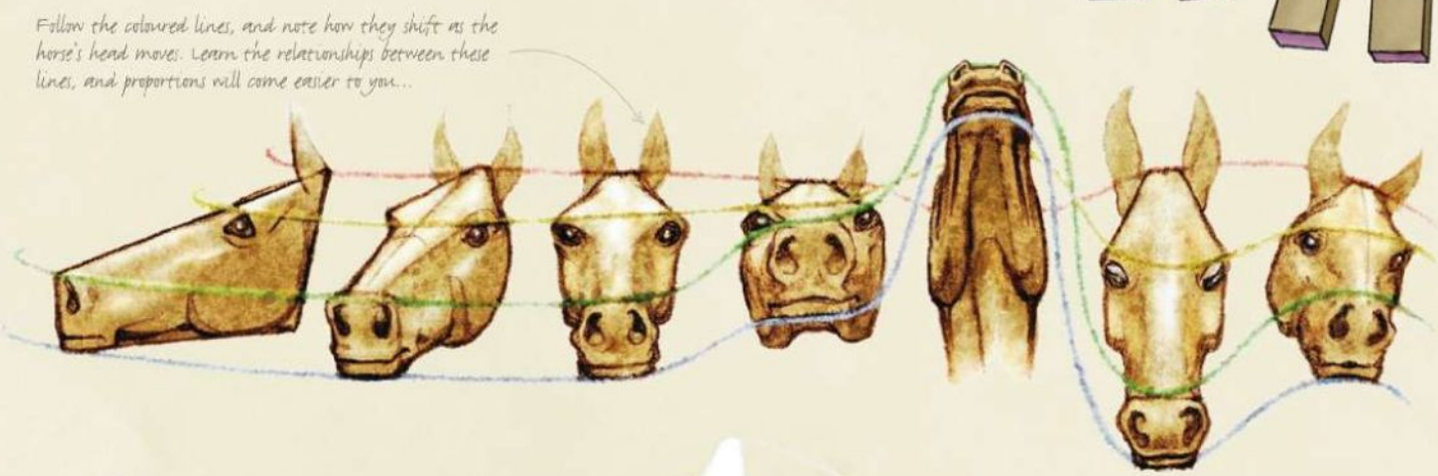
HOW TO KEEP PROPORTIONS CORRECT WHEN DRAWING ANIMALS FROM DIFFERENT ANGLES...





The longest measurement of anything – a bone, a limb, or an entire animal – is its major axis. When you look along something, its length appears to collapse until you can't tell how long it is. Artists keep track of this so that they can tip, swivel and roll objects around, yet keep them looking true.











The length of the metatarsal appears to shorten when it comes forward. That's foreshortening. Beginners fear it: serious students work on it: Masters practise it to ease.

HOMEWORK ASSIGNMENT

Learn from the rabbit

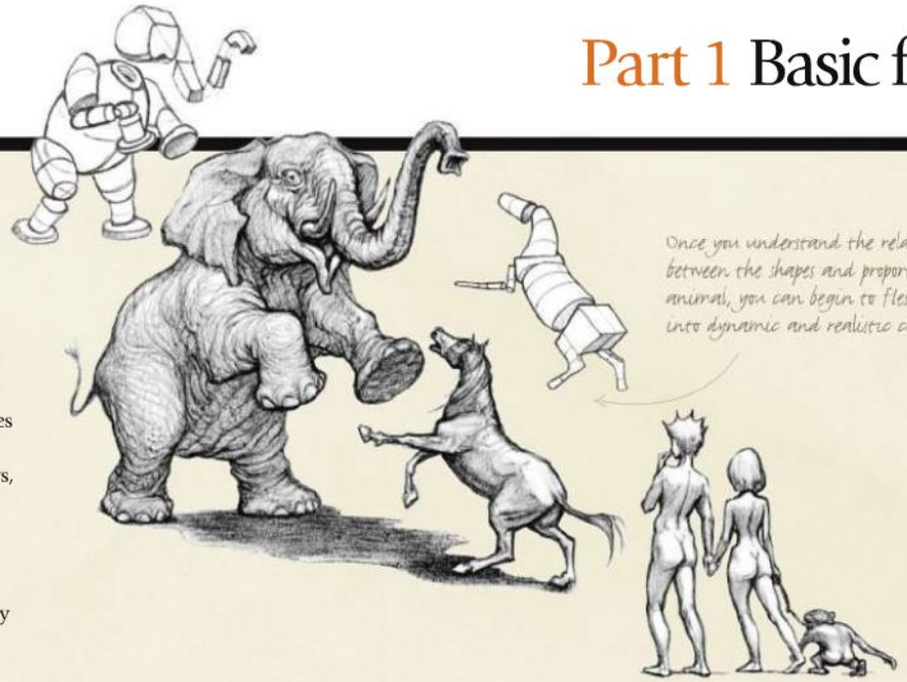
Look at a side view of an animal. Now draw it as if swivelled into a three-quarter foreshortened position. It's difficult, but not impossible. Remember to reduce complex forms to simple ones to help you visualise the perspective.

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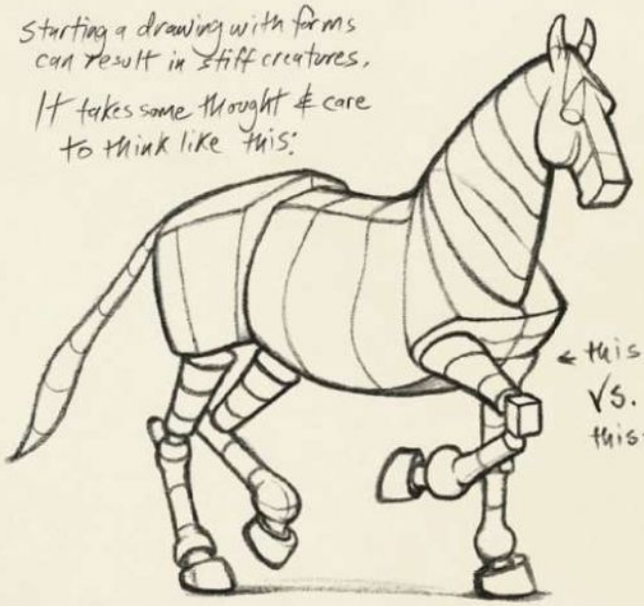
FORMS

SIMPLIFY ANIMAL ANATOMY INTO BASIC STRUCTURES...

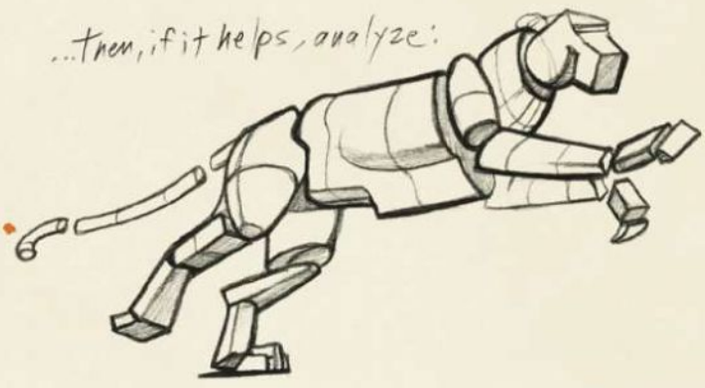
Mastering classic animal drawing enables you to invent as well as observe. The secret is to learn simple forms – cylinders, blocks, and spheres that are based on anatomy – then assemble them into complex beasts. After all, what are animals but 3D creatures in a 3D world? You can build them from 3D forms – any way you like!

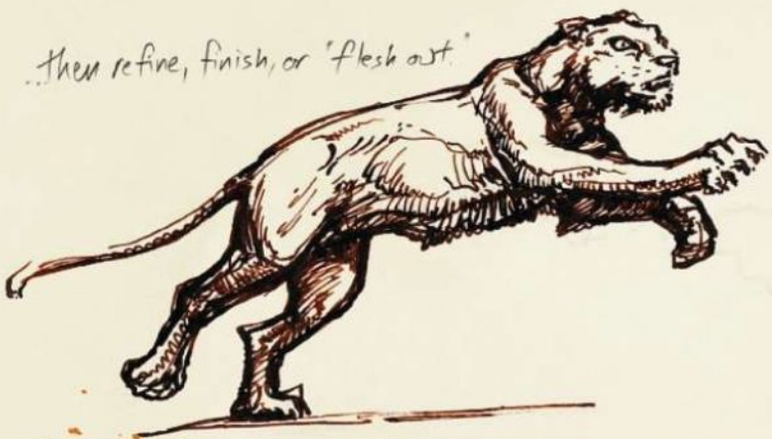


Once you understand the relationship between the shapes and proportions of an animal, you can begin to flesh them out into dynamic and realistic creatures.











We study proportion, anatomy & form so that we can forget about them.

Slow-motion disciplines eventually affect our fastest scribbles.

Artists arrange couplings.

Chaos & order
Energy & skill
Wildness & Control

FUSION TOWARD MASTERY

PART 2

THE ANIMAL TORSO

Artist PROFILE



Marshall Vandruff
COUNTRY: US

Take a trip to Marshall's website for more info
www.marshallart.com

On the disc
Find sketches by Marshall in the The Animal Torso folder inside Animal Anatomy

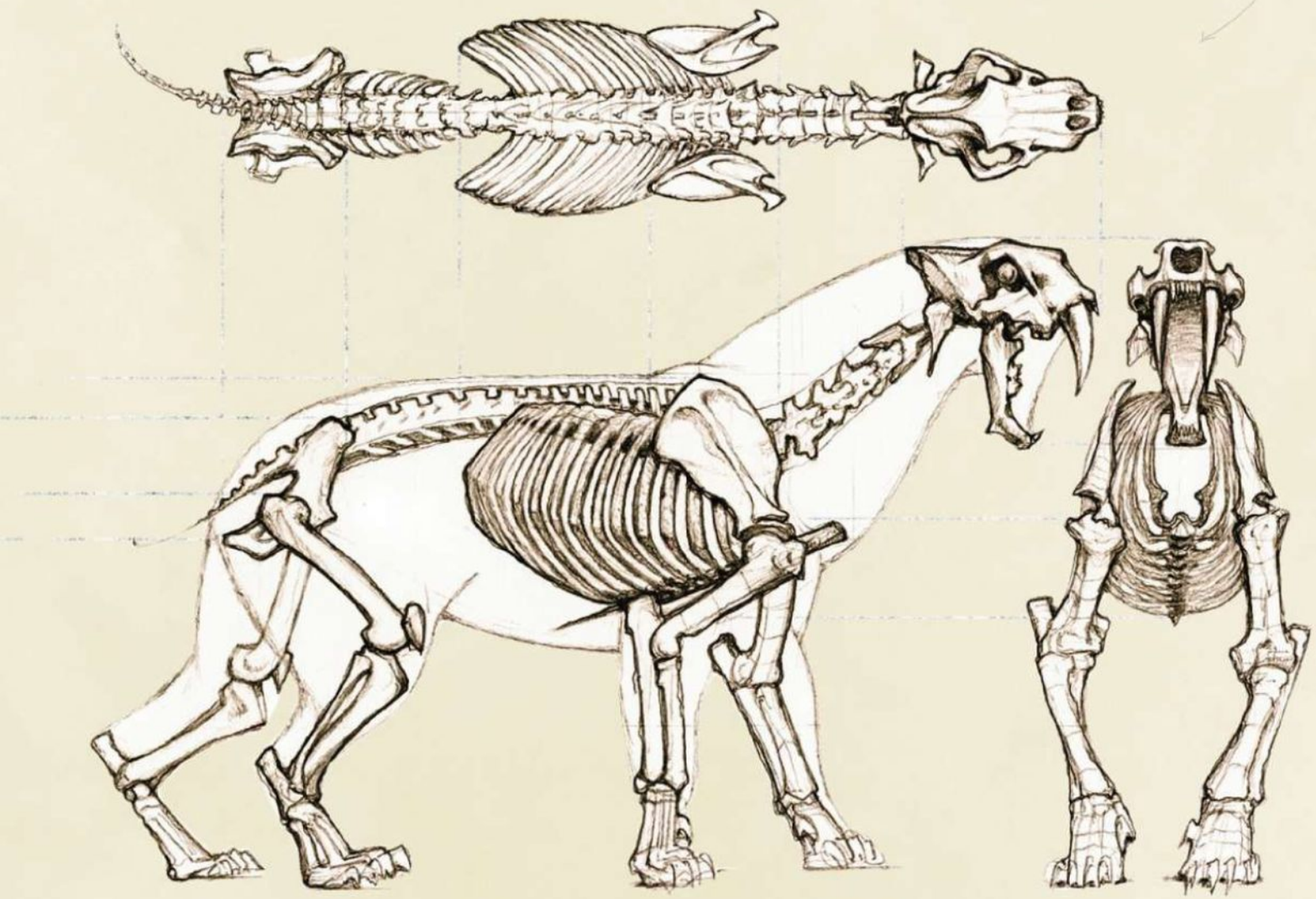
Find out how the core of the animal body operates and how you can use it to bring life to your animal artwork

When I first saw a famous art teacher's approach to figure drawing – human torsos with no limbs, strange-looking bean-bodies twisted and floating – it baffled me. It took me years to understand the value of that approach.

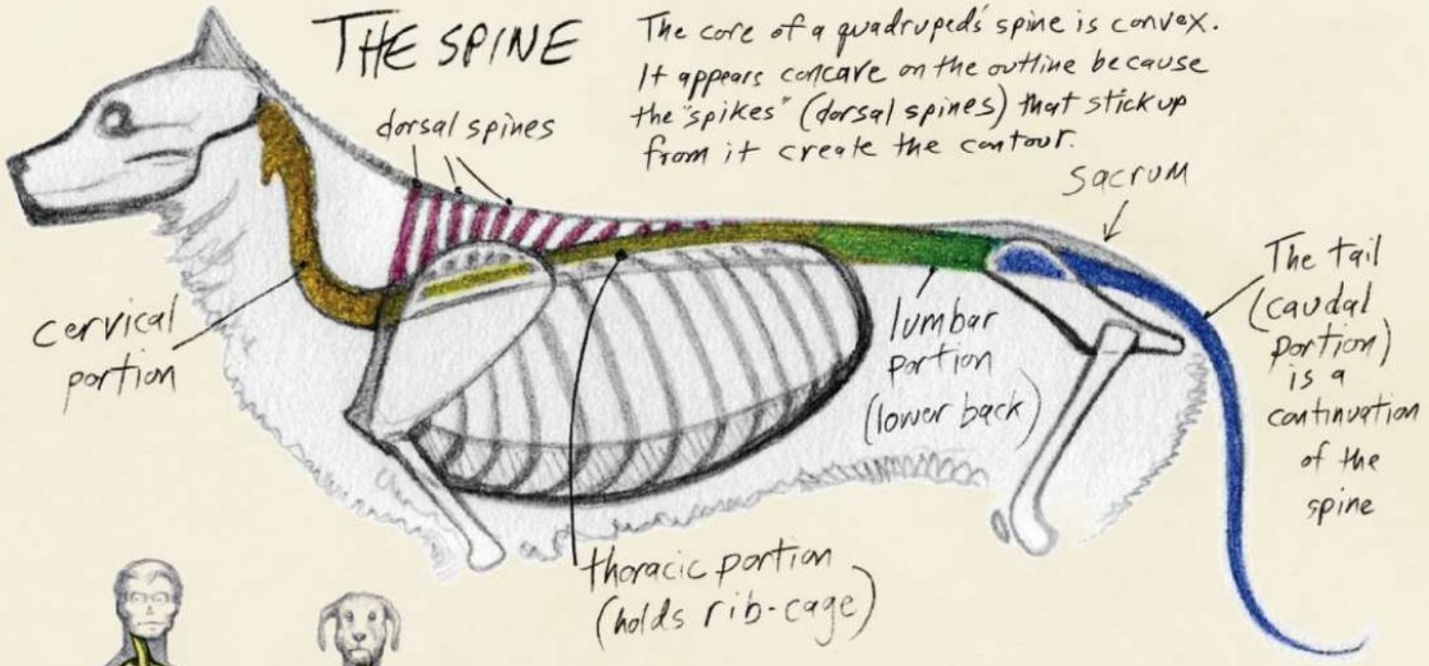
There are several sound ways to draw the figure, but beginning with a solid torso is a good one that's shared by Michelangelo, Rubens, Tintoretto and scores of other masters. It puts the big parts of anatomy first – which is the best place to start. This approach should be applied not only to human figures, but to animals. They have torsos much like ours, but are different in ways that enable them to run faster, jump higher, kick harder, and have trouble standing up or sitting in chairs. Here, I approach them simply, naming the basic parts, helping you to learn their structure and understand their functions. In later lessons, I'll get to the limbs, but let's begin with the big parts.



Just as 3D programs need three views to invent, so do artists. You'll understand anatomy best by drawing from different views, looking along, up and down at an animal.



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TORSO BONES

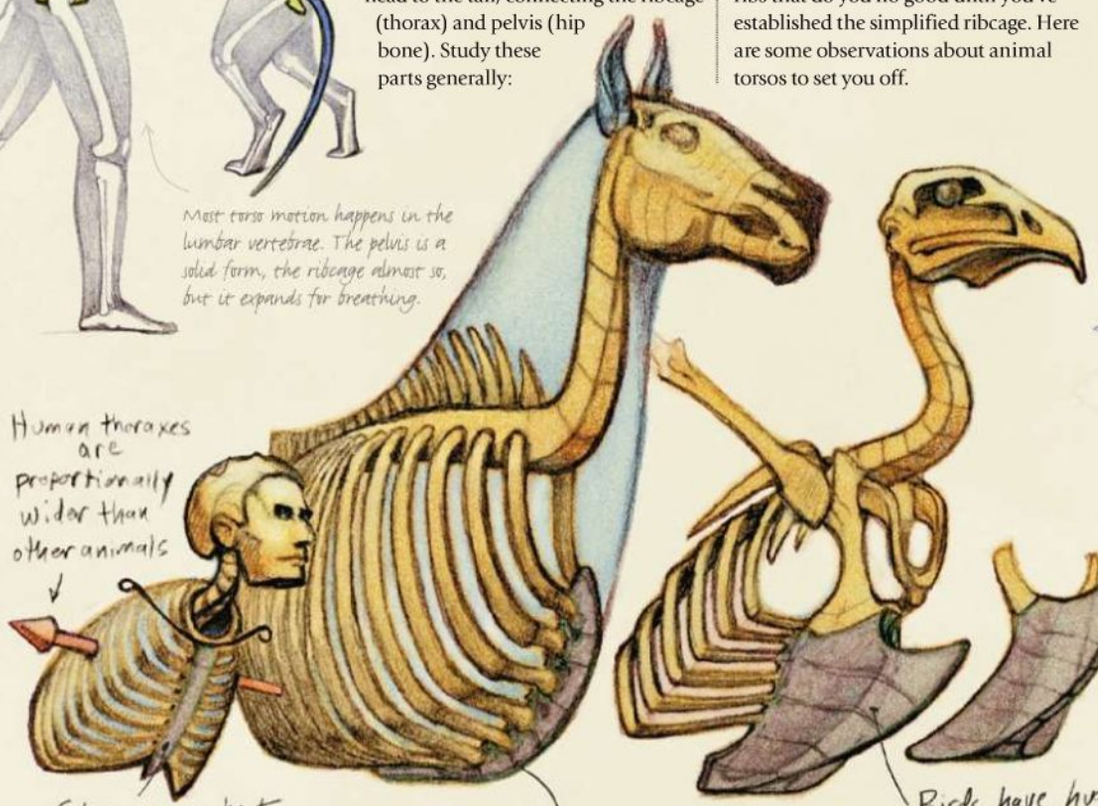
START WITH THE CORE OF THE BODY: THE RIBCAGE AND PELVIS, AND THE SPINE THAT CONNECTS THEM...

Vertebrate animals grow out from the spine, which runs from the base of the head to the tail, connecting the ribcage (thorax) and pelvis (hip bone). Study these parts generally:

ignore the little bumps on the pelvis that are mostly hidden and the individual ribs that do you no good until you've established the simplified ribcage. Here are some observations about animal torsos to set you off.



Most torso motion happens in the lumbar vertebrae. The pelvis is a solid form, the ribcage almost so, but it expands for breathing.



HOMEWORK ASSIGNMENT

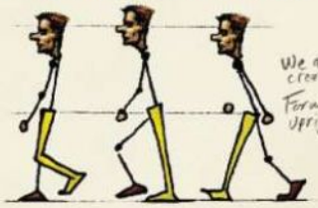
See the spine

Draw a series of animals with a single line – the spine. It's easiest from the side view, but don't forget to see the convexity of the curve – and don't expect it to impress anyone. It's an exercise to develop the X-ray vision of artists who know anatomy. When it gets easy, make it tougher by adding the ribcage and pelvis.



TORSO MUSCLES

BONES DON'T MOVE UNDER THEIR OWN POWER – THEY MOVE BY THE TENSION OF HIDDEN CORDS...

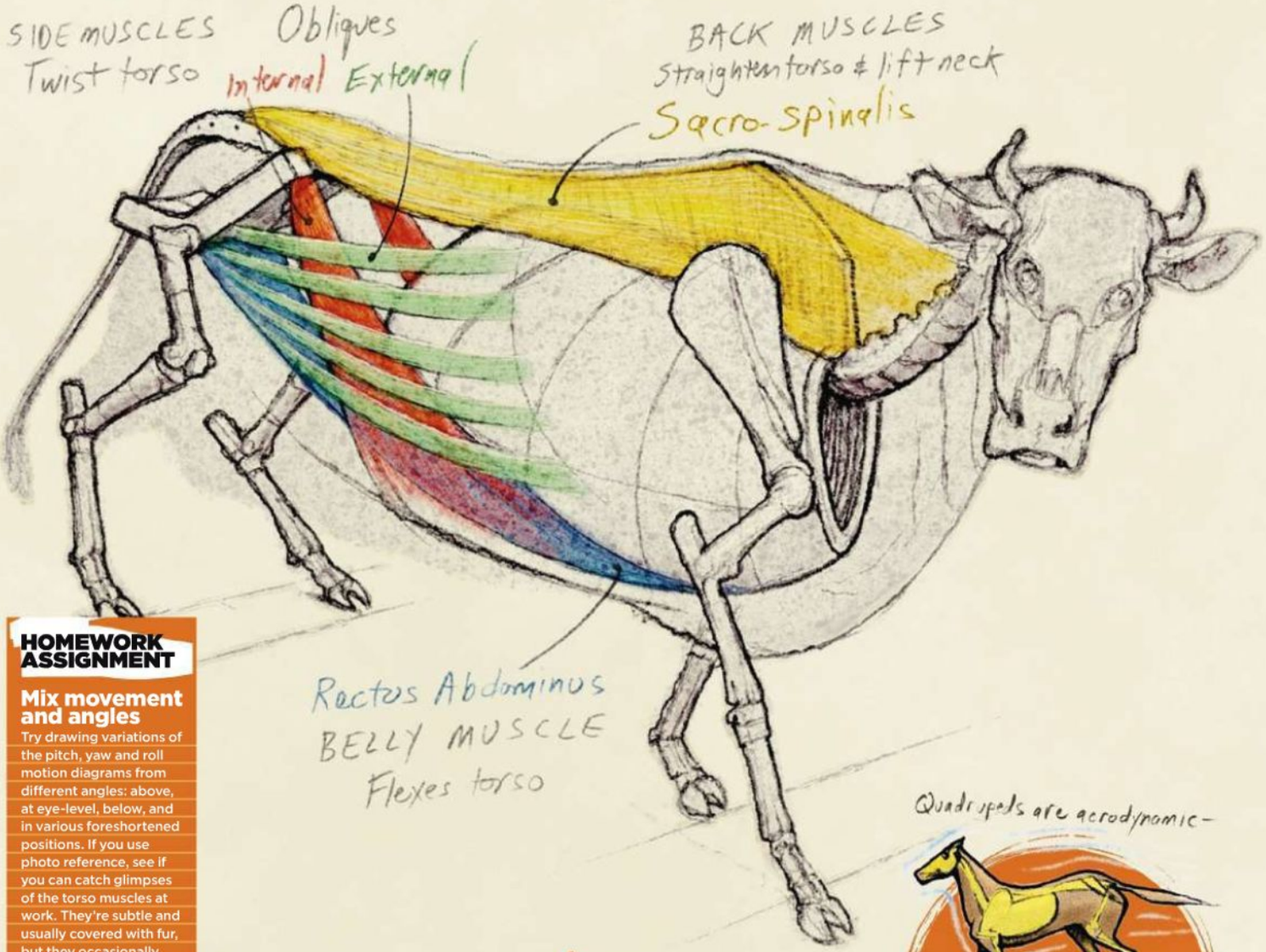


We have muscles in our backs, bellies and haunches to hold us upright. Four-legged animals have the same muscles, but in different proportions and for different reasons. They are made to move forward more efficiently than we are.

Torso muscles include thin layers that don't show on the surface. I'll focus here on the core functional set of three.

Straight muscles, like those on the back and belly, simply pull to straighten or bend the torso. But spiral or oblique muscles, like those on the side, pull to spin or twist the torso, allowing it to lean and turn. These muscles can barely be seen on a fleshed animal, but study them to know what goes on under the surface, so you can exaggerate convincingly.

Unlike bones, muscles change shape. Think of them as rubber straps. They either stretch and get thinner, or squash and get thicker.



HOMEWORK ASSIGNMENT

Mix movement and angles

Try drawing variations of the pitch, yaw and roll motion diagrams from different angles: above, at eye-level, below, and in various foreshortened positions. If you use photo reference, see if you can catch glimpses of the torso muscles at work. They're subtle and usually covered with fur, but they occasionally show up in extremely well-cut short-haired animals, like racehorses.

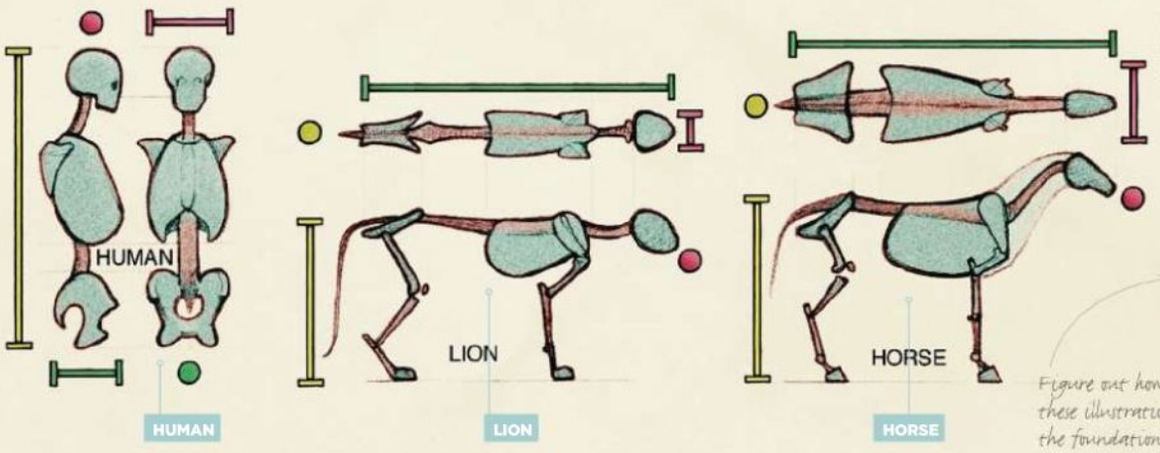




PITCH, YAW & ROLL

As animals travel, they adjust their movement in the same three ways as aeroplanes. Pitching describes the forward and back movement – the back and belly muscles at work. Yaw means heading to the left or right, muscles on one side pull the torso toward that side. Rolling (also called banking) happens when muscles on each side pull to twist the ribcage so that it leans into a turn.

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Horses are the opposite shape to cats – wide at the pelvis, and narrow at the head.

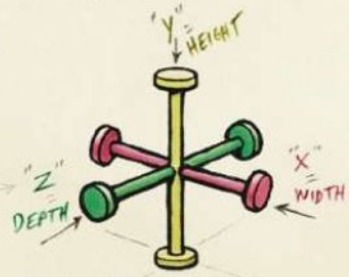


Figure out how the colour legend applies to these illustrations and you'll understand the foundation for making anatomy three-dimensional.

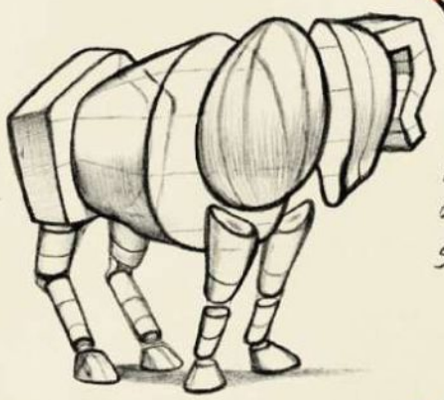
TORSO FORMS

UNDERSTANDING MULTIPLE VIEWS AND BUILDING FROM SIMPLE COMPONENTS...

Studying side views isn't enough – they only give us two dimensions of a three-dimensional animal. We need another view to see width measurements, as witnessed in the examples above.







Form studies needn't be based on anatomy – sometimes they simply help us see planes as we "rehearse" for a drawing.



There's no one correct form metaphor in constructing an animal's torso, but some are more useful than others. Use whatever forms you need to create their structures and place our points-of-view. Choose what works for you, however strange it may appear.

HOMEWORK ASSIGNMENT

Sort out the big things first

Analyse reference of horses and cats. You'll find that horse torsos fit into a single box because their spines are quite rigid. Cats however twist around, so you'll need separate forms for the pelvis and thorax. Solve those big forms before you concern yourself with limbs or textures.

MORE TORSO FORMS

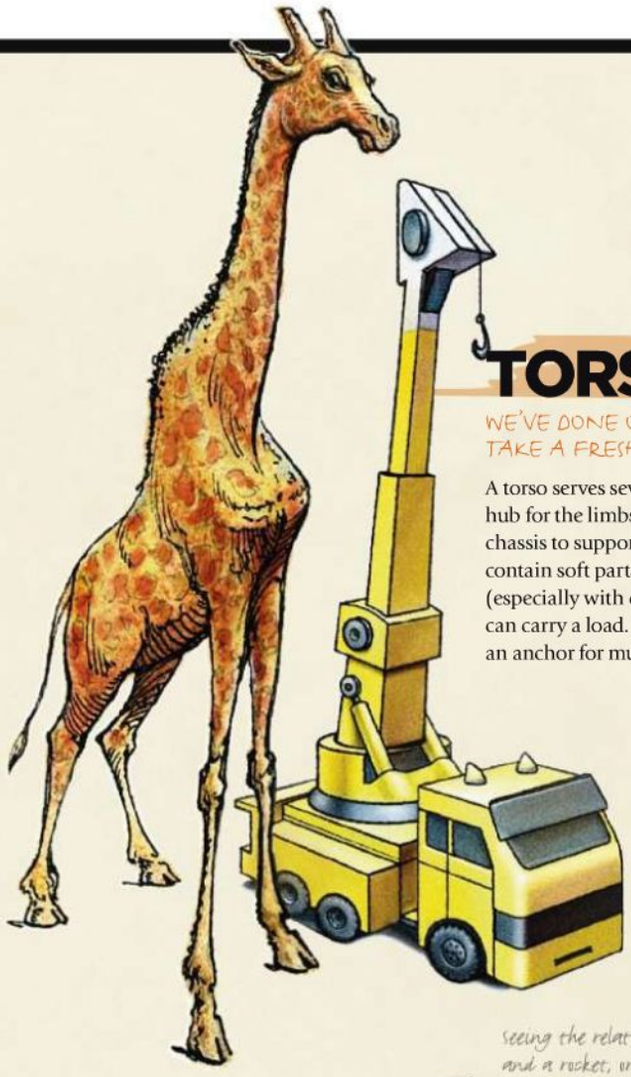
LEARN TO DRAW THE COMPLICATED THINGS BY MAKING THEM SIMPLE...

Look for the basic structure that simplifies bone and muscle into a single form. It can be a big bean from which appendages emerge, or any invented form that helps you twist or add body to the spine.

The important thing to remember is that torsos are complex, so you must simplify them enough so that they can be drawn in any position you care to choose.



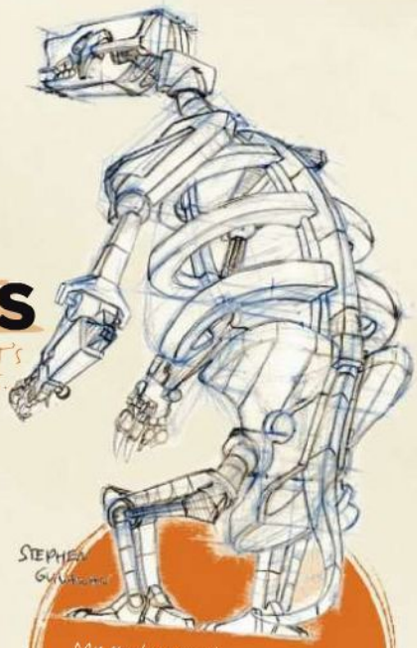
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TORSO FUNCTIONS

WE'VE DONE OUR TECHNICAL HOMEWORK – NOW LET'S TAKE A FRESH LOOK AT WHY WE STUDY TORSOS FIRST...

A torso serves several functions: as a core for the body; a hub for the limbs; a trunk from which branches emerge; a chassis to support a craning neck. A ribcage is a cage to contain soft parts and protect them. A spine is a spring (especially with cats), or a bridge, or a flatbed truck that can carry a load. A bird's sternum is both a boat's keel and an anchor for muscles...



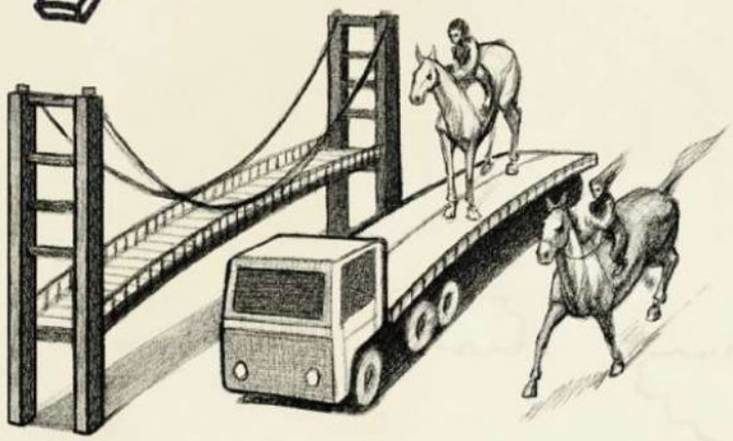
My student Stephen Gunawan did this exaggerated analysis of a sloth skeleton, treating bones as robot parts, and understanding their mechanical functions – a great way to learn.

Find your own comparisons for fun and insight. The foundation of creativity is making connections. Anatomy and form are technical skills, whereas analogies are creative.



Seeing the relationship between a horse and a rocket, or a cat and a slinky, helps us exaggerate.





Study structure, and compare it to other structures. Good designs have common foundations, so do what you can to spot them and use them.



Torsos are the source of the other parts. The hindlegs, forelegs, neck and head emerge from it. In the next two workshops, we'll study the limbs of four-legged animals and compare them to our own, beginning with hindlegs.



PART 3

THE HIND LEGS



Marshall Vandruff
COUNTRY: US

Take a trip to Marshall's website for more info
www.marshallart.com

On the disc



Find sketches in The Hind Legs folder inside Animal Anatomy

Explore the rear-wheel drive of animals, and how you can use this part of the body to propel your artwork forward

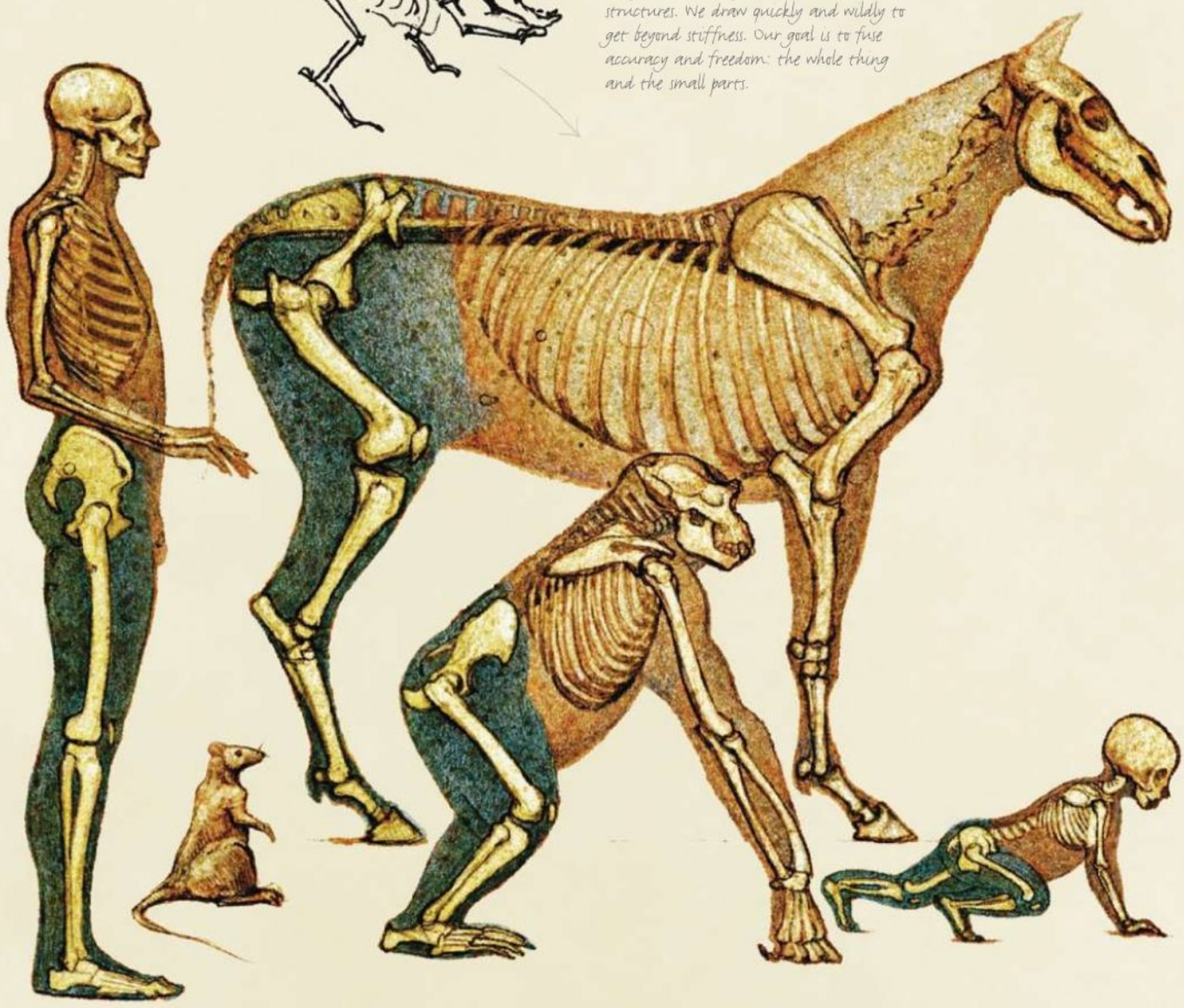
When the first artists drew animals, they drew the way all children still draw, with outlines around the shapes they could see. That's the foundation of drawing: charming and primitive. As drawing evolved, artists worked to make their illusions seem real, as if the picture was a window into a world of animals with meat on their bones.

Look at an animal's hind leg, and you'll see a shape. Cartoonists capitalise on that. You'll also see a surface with colour and texture: short hair, long hair, rough skin, smooth skin, mottled, groomed, light, dark… Painters and photographers care deeply about such surfaces.

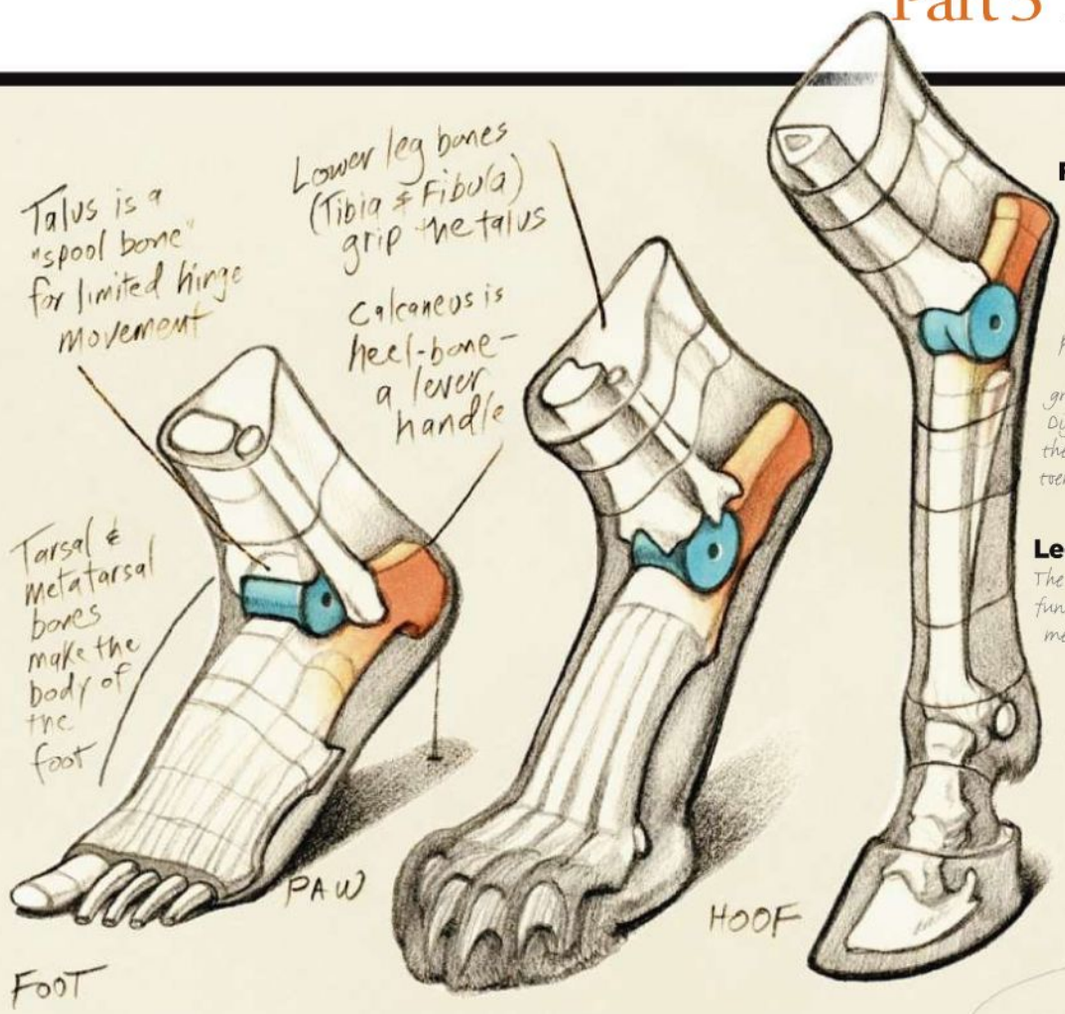
However, I'll begin with bones and muscles. I'll explain how these affect the living animal's rear-wheel drive system: its hind legs.



Drawing, like any artistic discipline, requires contradictory skills. We draw slowly and carefully to learn the structures. We draw quickly and wildly to get beyond stiffness. Our goal is to fuse accuracy and freedom: the whole thing and the small parts.



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Foot bones

You can study between 10 and 20 bones in a foot, but it's easier to group them. The most important are the heel (calcaneus) and ankle (talus) bones, coloured here to show their placement and function.

Plantigrades plant their feet on the ground. We call their feet, feet. Digitigrades walk on their digits; we call their feet paws. Ungulates walk on a toenail or two, which we call hooves.

Leg mechanics

The best way to understand bones is by their function. Try to see them as perfectly designed mechanical assemblies.



The femur has a ball at its top. The pelvis has a socket. These form a perfect union for getting around.

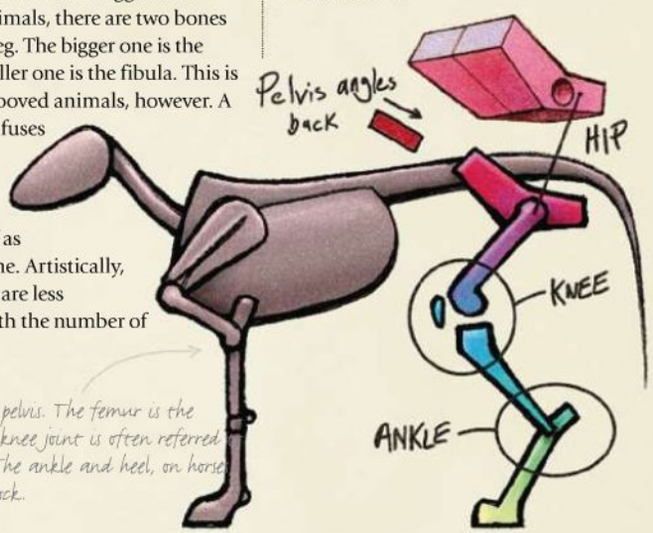
The ball-and-socket joint of the hip enables the upper leg to swing and swivel, kicking out to the side.

HIND LEG BONES

BONE MACHINERY: UNDER ALL THAT FLESH IS A MECHANISM OF SOCKETS, HINGES, LEVERS AND SPOOLS...

Whichever names you choose to use to refer to the bones in the leg – femur, fibula, tibia, tarsal mass, or others – they still have the same job: to support and propel the animal, and, occasionally, to enable it to kick out at an aggressor.

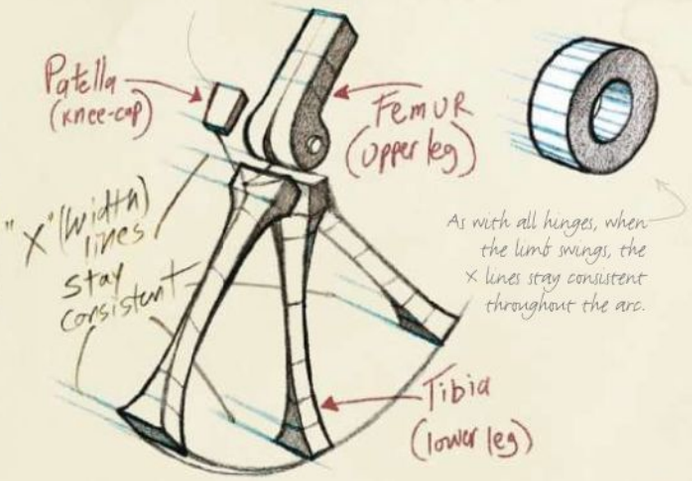
In most animals, there are two bones in the lower leg. The bigger one is the tibia; the smaller one is the fibula. This is different in hooved animals, however. A horse's fibula fuses right into the tibia, and so it can hardly be thought of as a separate bone. Artistically, however, you are less concerned with the number of bones in the lower leg, and more concerned with the fact that hooved animals don't wiggle their toes or retract their claws. This means that they don't need a wide lower leg to anchor those extra muscles.



The hip is the pelvis. The femur is the upper leg. The knee joint is often referred as the stifle. The ankle and heel, on horse is called the hock.

Knee bones

The knee is a hinge joint, but it isn't fixed like a door hinge. The kneecap (patella) pulls on a strap to lift the lower leg.

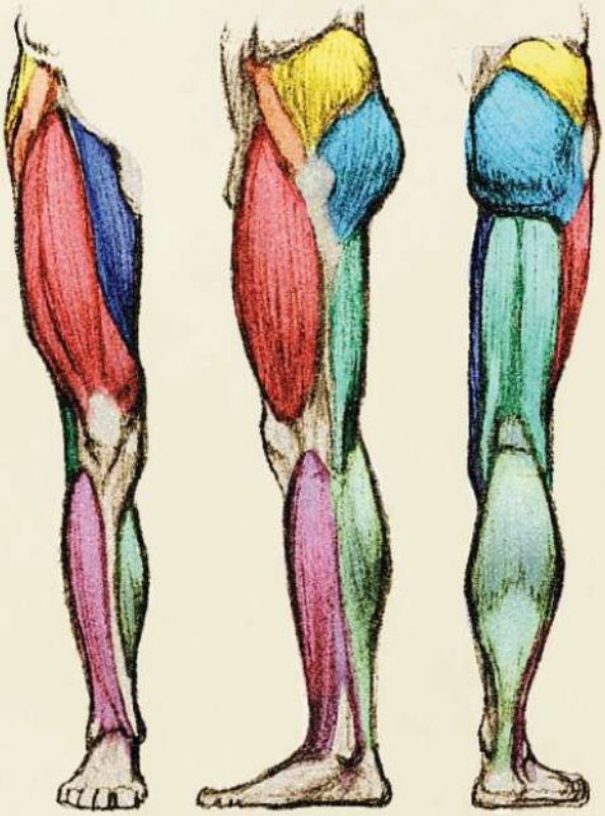


As with all hinges, when the limb swings, the X lines stay consistent throughout the arc.

MUSCLE GROUPS

HUMAN AND ANIMAL LEGS BOTH MOVE BY THE SAME SOURCE – THE PULL OF MUSCLES...

There are over 16 muscles in the hind leg that artists can study – but even if you came to know every one of them, it would help you less than knowledge of their groups and functions. Here are the simplified structures for understanding hind legs.





Quadruped muscle charts use different names for the variations, but there are two consistent groups: the big pair on the upper leg, and the smaller pair on the lower leg.

A big pair

Quadriceps and hamstrings are the main group of the upper leg. The quadriceps (red) on the front of the thigh pull on the kneecap to straighten the lower leg. The hamstrings (green) on the back of the thigh pull on the lower leg bones to bend the leg.

Compare the colour maps of the human muscle groups to those of the horse and the bear.

A bear's hind leg is remarkably similar to a human's, mainly because bears also plant their feet on the ground.



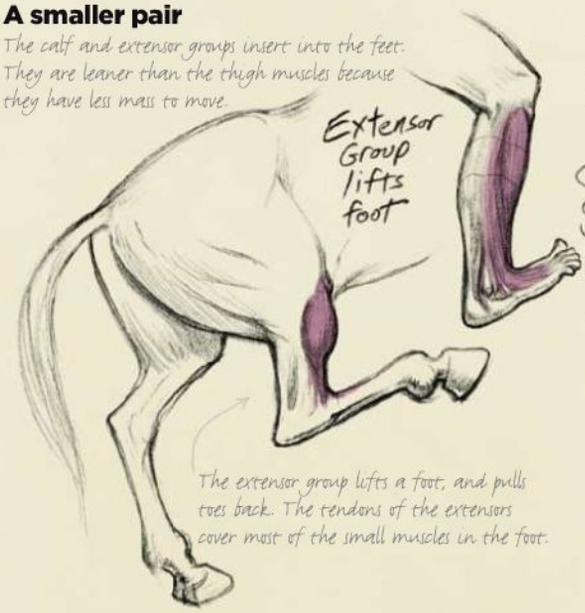
HOMEWORK ASSIGNMENT

Target the muscles

Once you understand the basic groups, you can separate them into individual muscles. For example, the hamstrings are divided into two parts: the medial (inner) and lateral (outer) sets. The medial set actually divides into two more: the semitendinosus and semimembranosus. Names like that can put off delicate learners, but note that, on a horse, the semimembranosus muscle alone is larger than a human's entire upper leg.

A smaller pair

The calf and extensor groups insert into the feet. They are leaner than the thigh muscles because they have less mass to move.



The extensor group lifts a foot, and pulls toes back. The tendons of the extensors cover most of the small muscles in the foot.

The heel of the horse, like any hooved animal, is high in the air. The proportion is very different from a human leg, but it has many analogous parts. Remember that muscles are bulkier near the torso and leaner as they move down the limb.

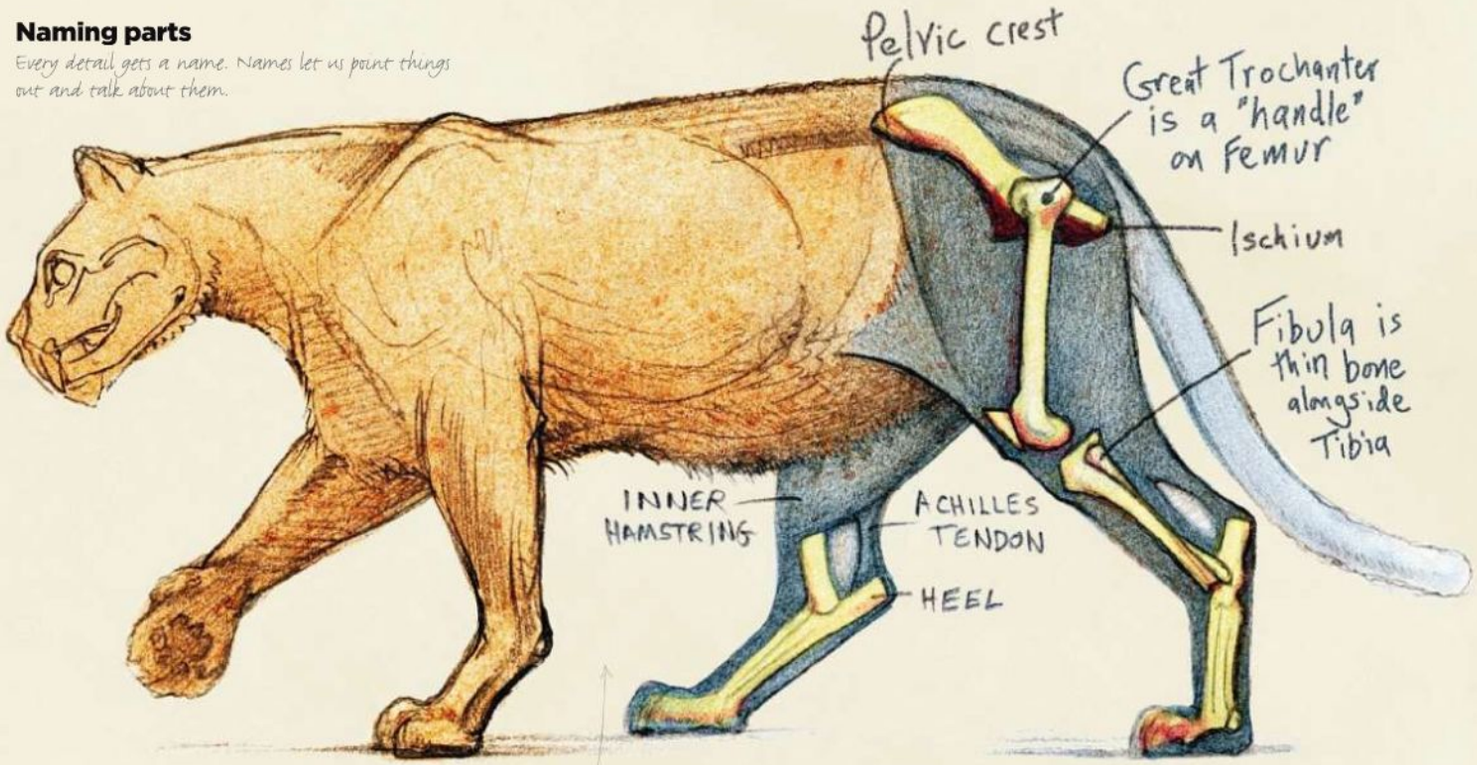


The calf group pulls an animal up onto its toes, and propels it.

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Naming parts

Every detail gets a name. Names let us point things out and talk about them.



INTERNAL STRUCTURE

THE SURFACE OF AN ANIMAL IS DETERMINED BY THE SUBSTANCE INSIDE, SO DEVELOP X-RAY VISION TO DRAW WITH AUTHORITY...

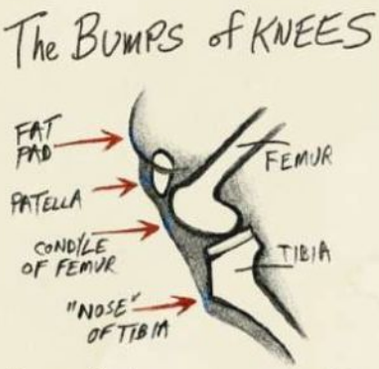
Study animal anatomy from books, and you'll find that four books may use four names for the same part. The part that I've labelled pelvic crest on this cat can be found in any book – but it may be called the pelvic point, the tuberosity of the iliac crest, the tuber coxae or the anterior superior iliac spine. If you're trying to impress people, you should learn all the names. But if you're trying to master drawing, any name will do. Your concern isn't the name, but that it's the wide point of an animal's haunch. Pelvic crest is fine.

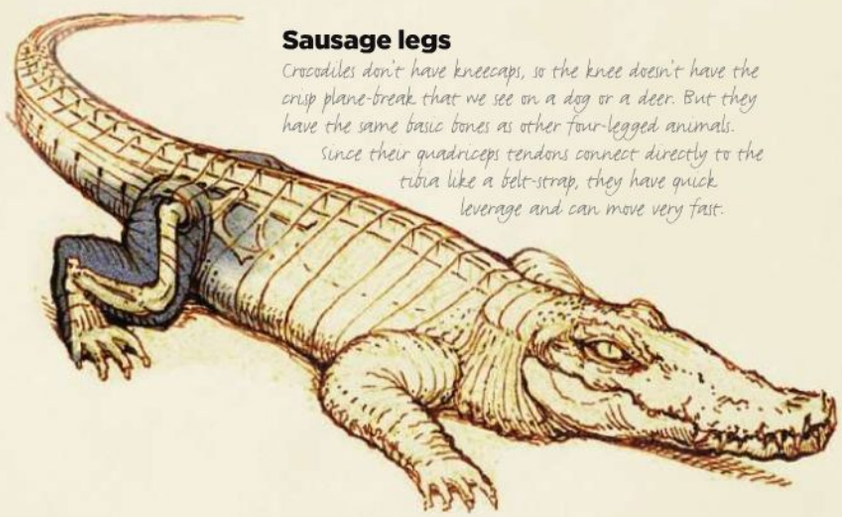
Most names, however, are consistent. The ischium is the ischium – there's no need to distinguish it as the ischial tuberosity. But you do need to know that it's the back-most part of an animal's haunch, and always narrower (on the X measurement) than the pelvic crest.

HOMEWORK ASSIGNMENT

Exercise your X-ray vision

Choose your favourite photographs of animals in various positions. Place vellum or tracing paper over them, or make a layer in Photoshop, and try to draw the pelvis, femur, patella, tibia, fibula, and ankle bones in their proper positions. You may find it tough, but the attempt will help you to see the substance under the surface.



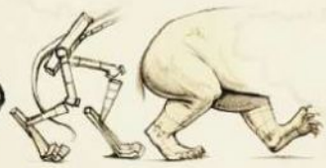


Sausage legs

Crocodiles don't have kneecaps, so the knee doesn't have the crisp plane-break that we see on a dog or a deer. But they have the same basic bones as other four-legged animals. Since their quadriceps tendons connect directly to the tibia like a belt-strap, they have quick leverage and can move very fast.

Knee clarity

Knees have several points that alternate for attention. The patella (knee-cap) is the most prominent point, but it connects to the nose of the tibia, which is a fixed bump on the lower leg. The outer swell on the femur, and the fat pad that covers the patella when a horse is relaxed, can all seem like the knee.



Repositioning

When you get good at visualising the underlying bones, try repositioning the legs and redrawing them.

HIND LEG FORMS

FORMS LET YOU INVENT LEGS THAT DON'T EXIST – UNTIL YOU CREATE THEM...

When we dream, or daydream, we imagine realistic images. The trick is to get those images onto paper. There's no better way to master this than to use wireframe structures based on simple forms. Anatomy is complex – but if you can see the bulk of the upper leg as an egg, the calf as a bowling pin and the foot as a stick and ball, then you simplify your task and turn the leg into something real.



Segmentation

The full form of the body takes shape if you segment it and work on each part as a separate block.



Round it out

Hind legs don't face forward in unison: they splay out. Here's a way to solve it... See how the entire body of the hindquarters fits into a cylinder.



Block it up

Block forms force you into specific choices about plane breaks, and help you chisel the form into crispness. Note also that from behind, you can see the legs facing out at a 30-40 degree angle.

HOMEWORK ASSIGNMENT

Wired forms

Get out those favourite photographs that you used to exercise your X-ray vision (page 75). Instead of looking for the bones inside the legs, try to wrap wires around the legs. If you find it tough, treat each part of the leg as a bar or a block, and visualise a rubber band around it. From there, it begins to take on form.

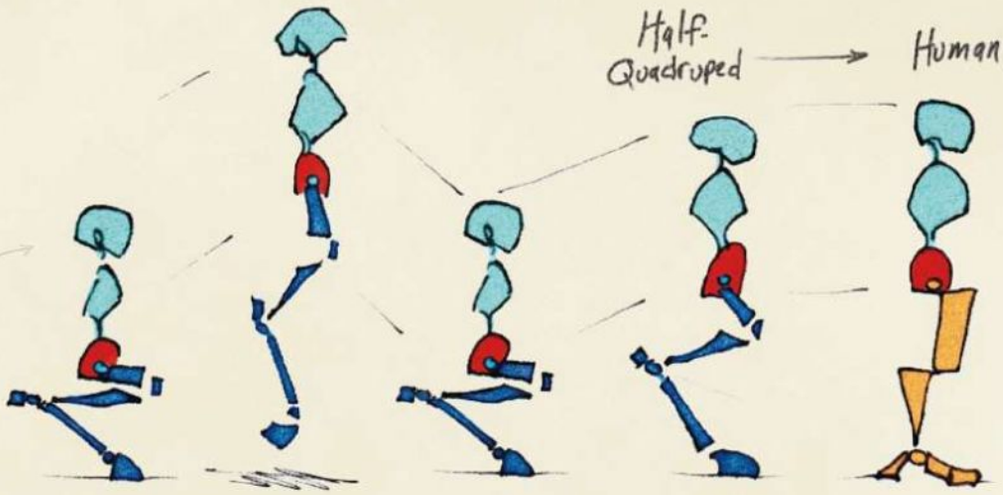
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Ron's robot

My student Ron Green invented this contraption. It's strange, but useful for understanding how an animal leaps from its hind legs. Try your own, based on anatomy.





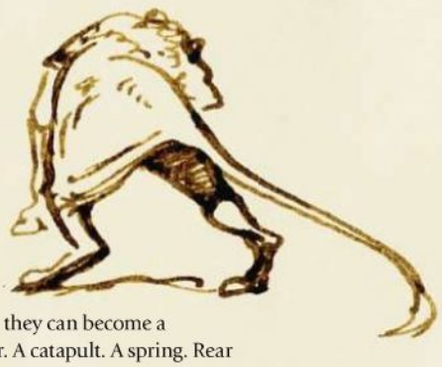


Artists must simplify to understand. Study Ron's drawings and you'll see that he is figuring out two problems: where the joints are, and how this half-quadruped leaps and bounces to get about.



Spontaneous art

The only way to master drawing is to draw, draw and draw – but not always carefully. Quick, gestural studies with pen and ink don't allow you to get fussy, erase and fix, and they protect you from creating belaboured work that looks dead – what Joe Weatherly calls "taxidermy". You'll sharpen your skills by drawing immediately from life, unpredictable and wild as it may be.



Forelimb fandango

We stand on our hind legs and use our arms and hands to perform delicate tasks and manipulate the world. Quadrupeds stand on their arms. The differences between arms and forelimbs are greater than those between legs and hind legs. In the next chapter, we'll study the forelimbs: arms as legs.



THE FUNCTION OF HIND LEGS

THEY JUMP, THEY WALK, THEY RUN, THEY KICK...

Once you know how they're made and how they're shaped, you can go back to the reason legs exist. Legs help support an animal. They get it moving to find food, or to keep it from becoming food. In the blink of an, eye they can become a weapon. A lever. A catapult. A spring. Rear wheels. Or a bludgeon. Seeing legs through their functions reminds us why they're worth studying.

PART 4

THE FORELEGS



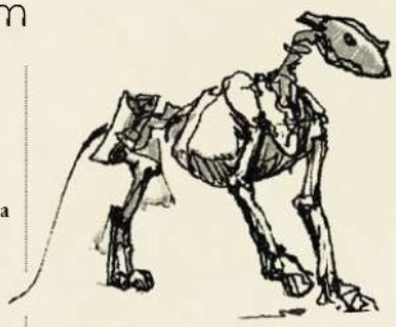
Use your knowledge and observation to build the pillars of balance and grip for the animal kingdom

Sometimes you have to take things apart if you want to know how they work. With animals, that gets messy. Beatrix Potter and her brother dissected dead animals together, which served her well as an illustrator. But dissection is not an easy business: you can end up smelly and confused.

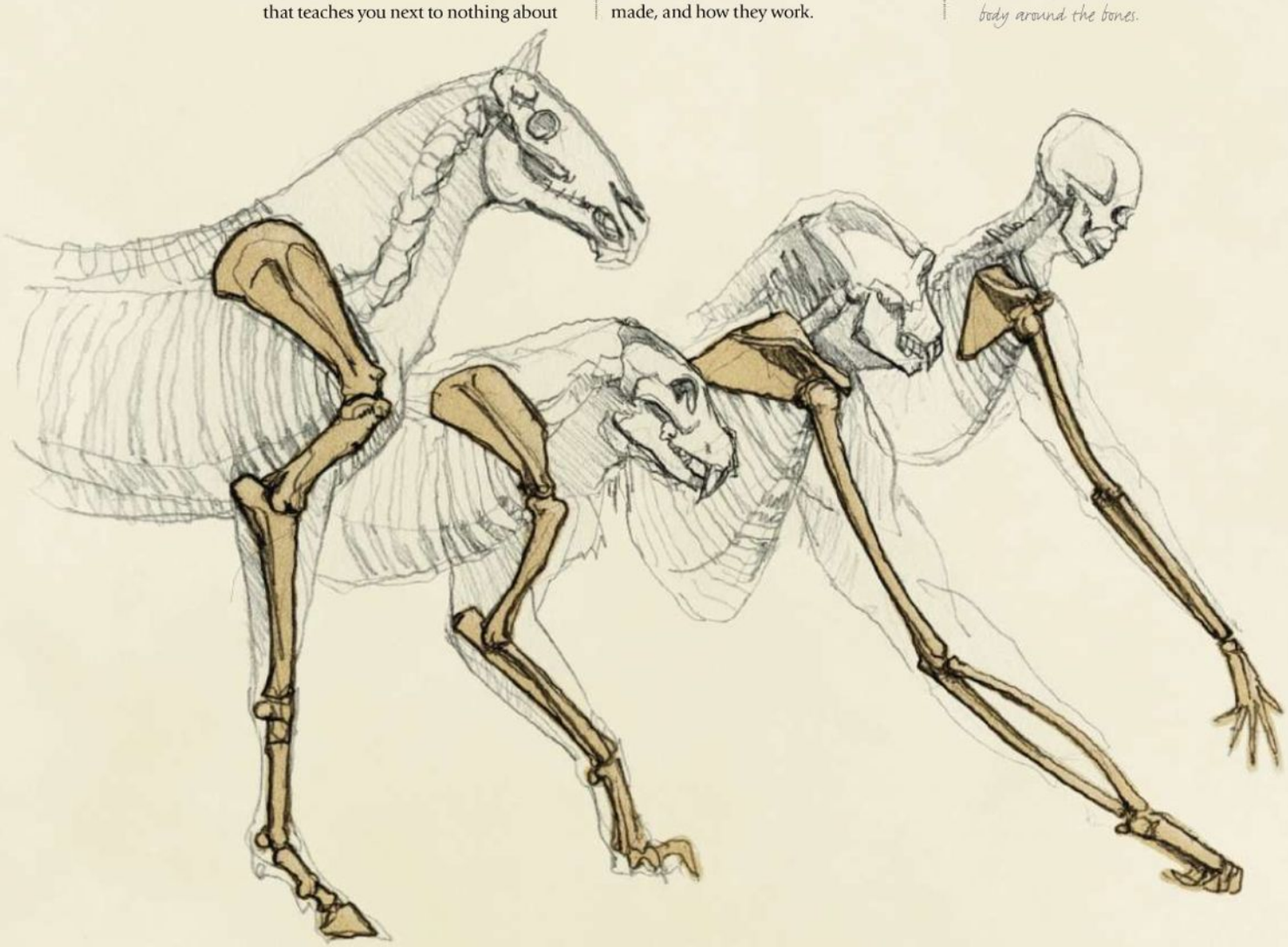
There are better ways to study animal anatomy. One is to observe museum skeletons from varying angles to be sure of their forms and connections. But assembled skeletons are often poorly put together and locked into a single position that teaches you next to nothing about how bones move. Another solution is to assemble bones on your own. I've assembled a horse's leg bones with glue and rubber bands. It's full-sized, it's real and it impresses friends and family, but I could never have done it without at least a reasonable amount of book knowledge.

The lessons that follow will help you understand bones and muscles enough to look at living animals and see their structure, so you can exaggerate proportions, make planes crisp and invent your own animals – imaginary beasts with real legs to stand on.

Let's have a look at how forelegs are made, and how they work.



We strip away the surface of an animal to see what makes it work. Artistic anatomy begins with the skeleton. The more familiar you are with the framework, the easier it is to build the body around the bones.

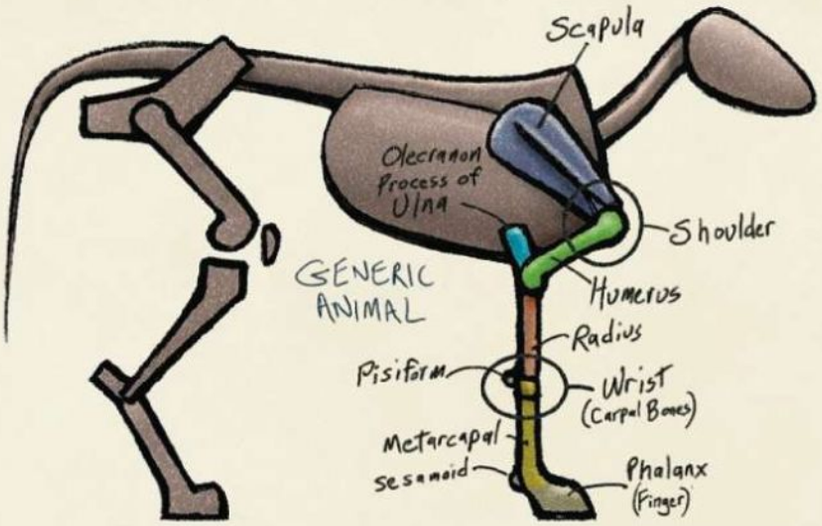


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FORELEG BONES

ANIMALS HAVE SHOULDERS AND ARMS LIKE US, BUT WITH A DIFFERENCE: THEY WALK ON THEM...

We have shoulder blades on our backs; quadrupeds have them on their sides. The shoulder blade (scapula) connects to the upper arm bone (humerus). This is obvious in a bone diagram, but on a fleshed animal, the upper arm is buried in the side of the body. That means you may mistake the lower arm bones (radius or ulna) for an upper arm unless you can see through the surface.

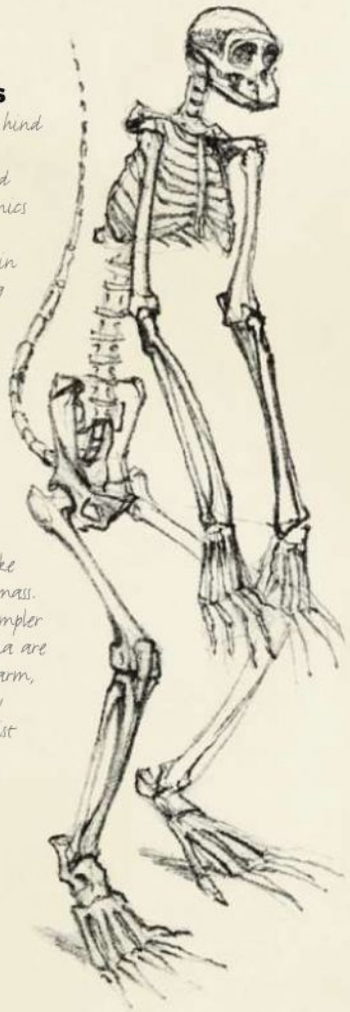


Legs, limbs and arms

Animal forelegs vary more than hind legs. Primates and the ancient ground sloth below have arms and hands. We'll look at arm mechanics on the next page – but first, notice that there are two bones in the forearm. The ulna is the big bump at the elbow that tapers to a small bump at the little-finger side of the hand. The radius is a small spinning button inside the elbow, which swells to hold the wrist bones at the thumb side of the hand.

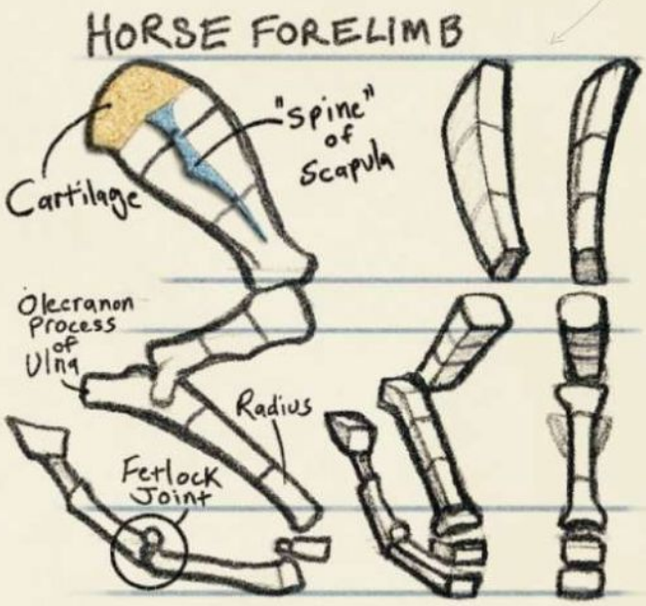
Hands usually have 27 bones. Several of them in the wrist make a simple form called the carpal mass.

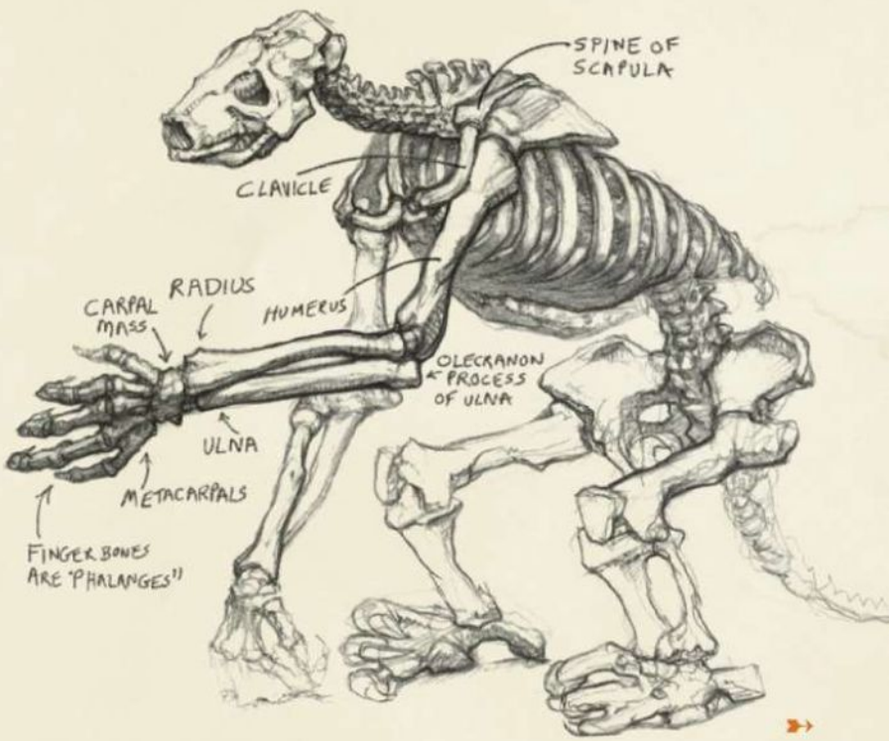
Hoofed animals have much simpler structures. Their radius and ulna are fused together into a single forearm, but we still distinguish the elbow portion as the ulna, and the wrist portion as the radius.



Not all is bone: cartilage happens

Horses and other hoofed animals (ungulates) have cartilage at the top of their shoulder blades. Cartilage wears away, so museum horse skeletons may appear to have the top part of the scapula chopped off. Living horses have larger shoulder blades than their dead relatives.

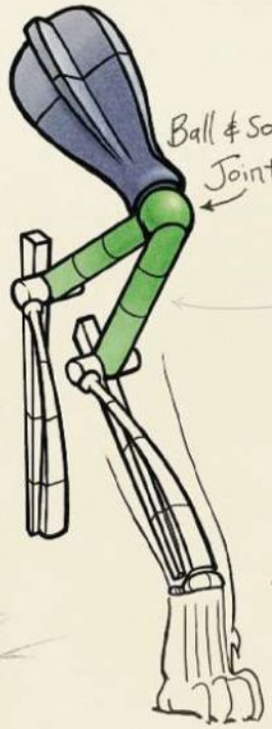




BONE MECHANICS

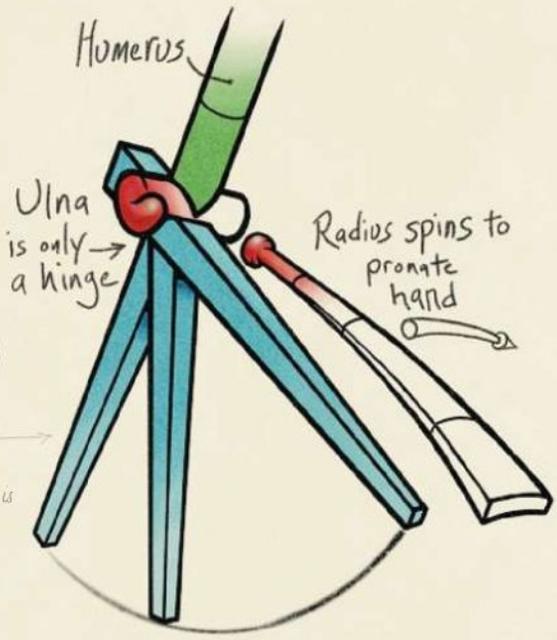
FORELEGS ARE FOR WALKING. IF THEY ALSO HAVE TO SPIN OR GRIP, THEY NEED MORE COMPLEX STRUCTURES...





Shoulders and elbows

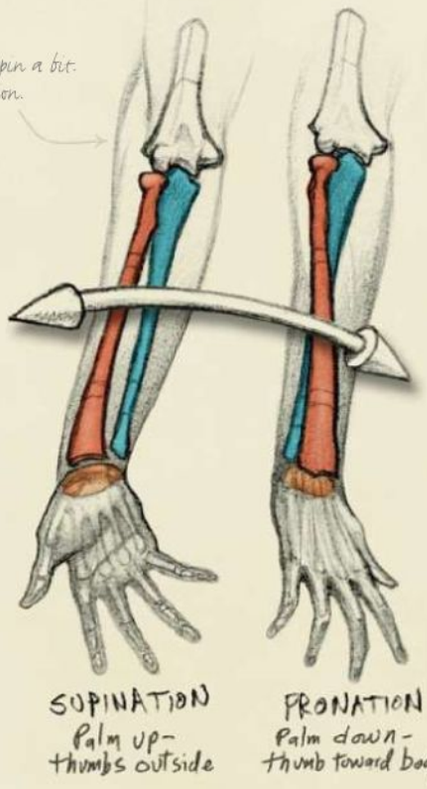
The ball and socket joint of the shoulder allows some rotation for an arm to spin or reach out to the side, as well as forward and back.



Of the two forearm bones, the ulna is only a hinge. Animals with hands also have a radius that spins.

Arm mechanics

Some forearms spin around. Some spin a bit. Some are fixed in a forward position.



Just as lower legs have two bones, so do lower arms. The difference is that we support ourselves with our legs, but use our arms to grasp and manipulate.

The ulna doesn't spin: all it can do is bend and straighten the arm. The radius is separate and revolves around the ulna to spin the hand. When it's parallel to the ulna, with the thumbs out to the side, it's supine. When the radius crosses over the ulna, carrying the thumb toward the body, it's prone.



Quadrupeds vary in their ability to spin their hands. Cats do it quite well, dogs not as well. Hoofed animals can't spin their forelegs at all. Their radius bone is fused into the ulna, locked so that they can run, but not reach out with an upraised palm.

HOMEWORK ASSIGNMENT

Stick-bone forelegs

Draw a series of arms or forelimbs by constructing them from simple stick-bones. It's usually best to draw the ulna before the radius, because the radius doesn't affect the ulna's position. Keep it simple. Don't try to learn foreleg anatomy by drawing forelegs: rather, learn by drawing their simple components.

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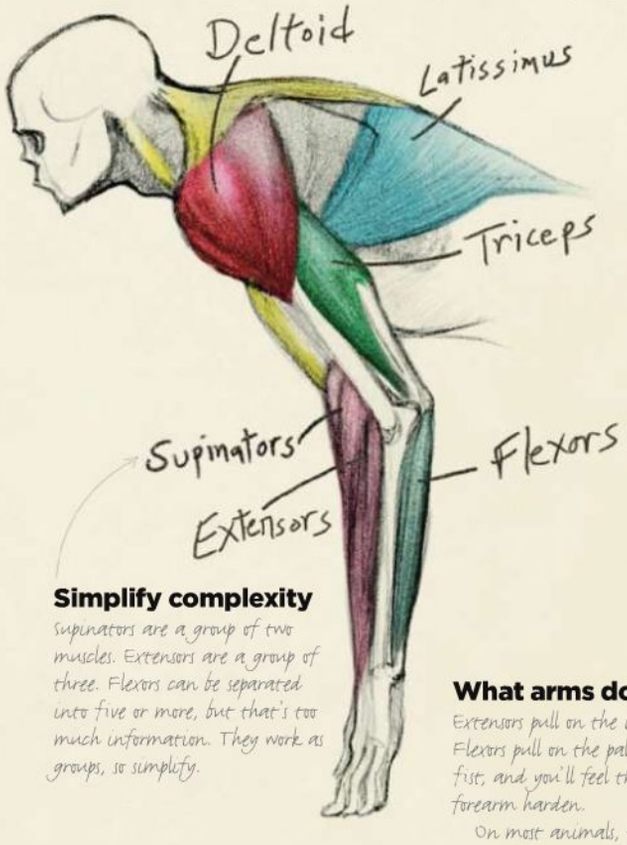
FORELEG MUSCLES

THE MUSCLES IN FORELEGS ARE SIMILAR FOR ALL ANIMALS, BUT THE VARIATIONS ARE MANY...

Human arms and animal forelimbs have many, but not all, muscles in common. Not only do our upper arms extend out from our bodies, but they reach above our heads. It takes a deltoid, anchored to clavicles and scapulae, to lift our arms.

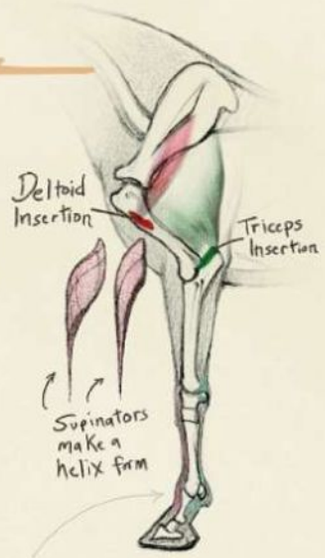
Quadrupeds have smaller and simpler deltoids than humans and apes.

Our lower arms spin partly from the pull of two special muscles called supinators, which make up the ridge of the extensor group.

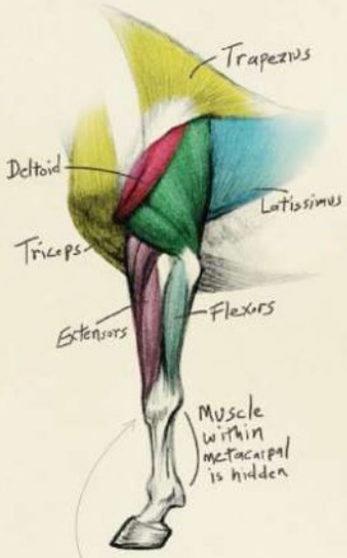


Simplify complexity

Supinators are a group of two muscles. Extensors are a group of three. Flexors can be separated into five or more, but that's too much information. They work as groups, so simplify.



Muscles pull bones. The major muscle forms of a horse's shoulder are the triceps and deltoid. Here we see that they both anchor on the scapula. The deltoid pulls the foreleg away from the body. The triceps extend the foreleg. Even though horses can't spin their arms, they have a slightly helix-shaped group at the ridge like we do.



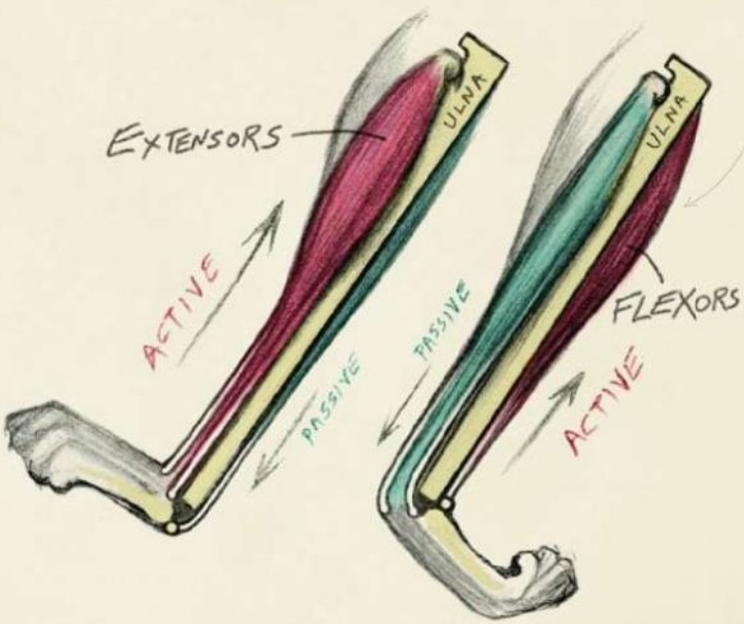
The trapezius and latissimus dorsi appear large on anatomical plates, but have little effect on the forms of animals. The trapezius is thin and sits over the top of deeper neck muscles. The latissimus usually disappears as it hugs the torso, but it can show up as a convex sliver on the side.

By the time we get to the metacarpal on an ungulate (analogous to our hand), the muscles are so deep and thin that artists don't study them. The bones, wrapped in ligament and skin, create the form.

What arms do to hands

Extensors pull on the back side of the hand. Flexors pull on the palm side. Clench your fist, and you'll feel the flexors on your inside forearm harden.

On most animals, the flexors are tucked under the inside of their forearms, barely visible on the outside.







Chest muscle

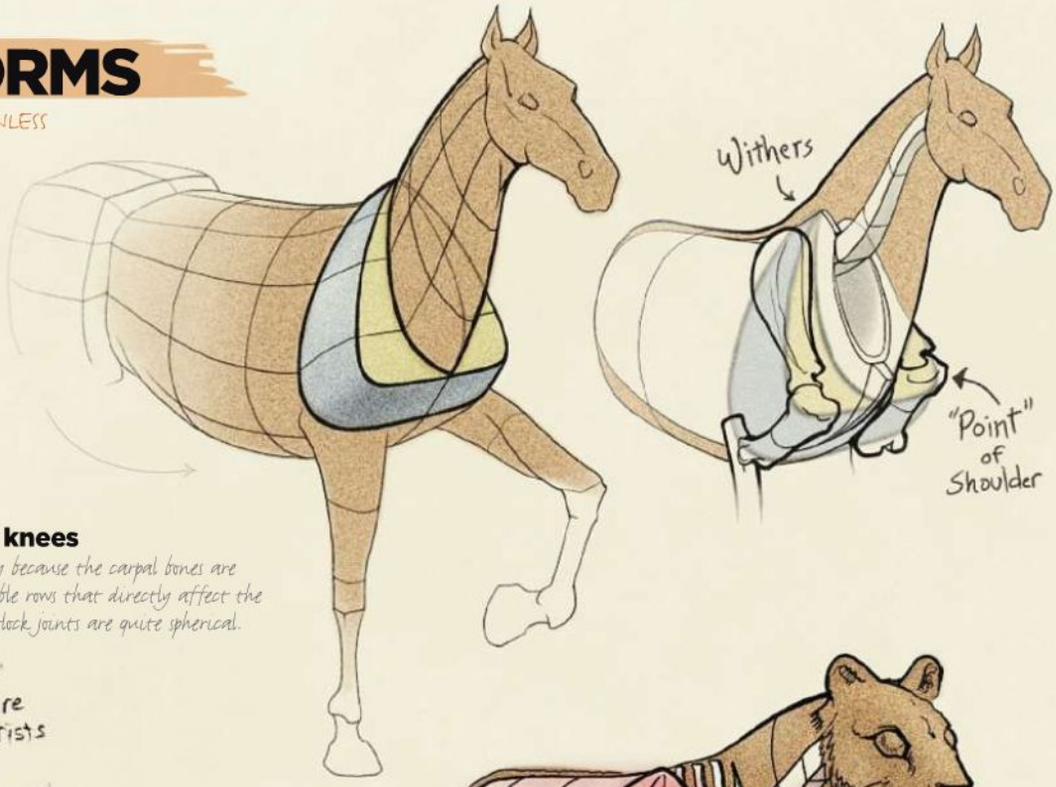
The pectoralis major anchors on the chest and inserts into the humerus to pull the upper arm down and lift the body. It's the same muscle you use in doing pushups. It shows on the surface as two varying egg forms on either side of the centre line of the chest.

On the horse, notice the rhythm of convex and concave lines. The outer contours tend to be more convex. The inner limbs from the front view have noticeably more concavity.

FORELEG FORMS

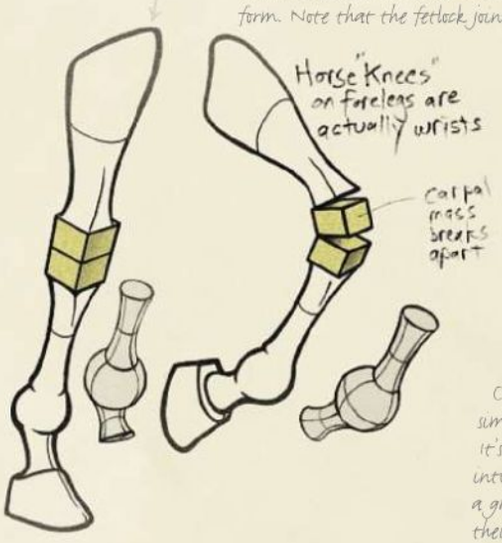
ANATOMY FOR ARTISTS IS USELESS UNLESS THE ARTIST GIVES IT FORM...

The scapula and humerus create the point of the shoulder. The scapula hugs closely to the centre line at the top and spreads out to the sides as it goes down... but that gets complex. When you construct a horse, it helps to simplify by seeing a wedge form, which is true enough to the anatomy of horse shoulders, but simple enough to master from memory.



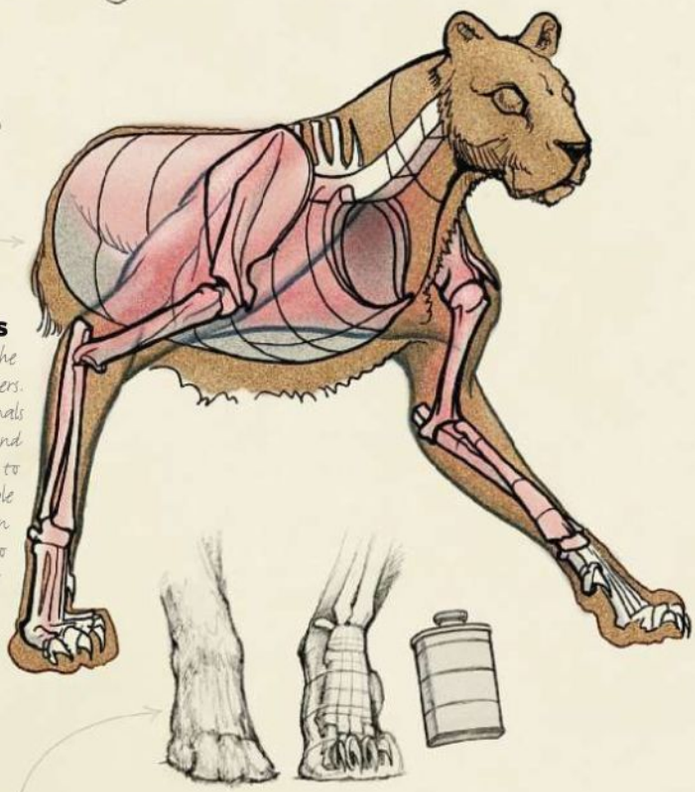
Breaking down knees

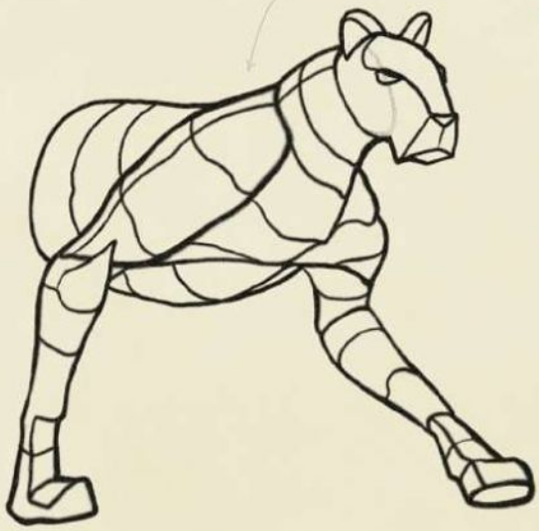
Horse knees are very boxy because the carpal bones are assembled in two breakable rows that directly affect the form. Note that the fetlock joints are quite spherical.



The problem with cats

Cats are so flexible that you can't use the simple wedge form you use for horse shoulders. It's difficult to simplify such fluid animals into box forms – they are more organic, and a greater challenge. You must see through to their bones, but you can do this with simple stick figures. For three-quarter views, turn the sticks into poles, drape some flesh onto the poles, and add cross-contours to be sure of the thickness.





From form to function

A cat's paw has texture and surface that is easy to see, but you must learn to see the form. Anatomy helps, but it may get unnecessarily complex. A paw is a simple block, convex to the front, like a whisky flask. Now you have a comparison that helps you see the form, memorise, and draw it.

The relationship of whisky flasks to a cat's paw ends there: they have very different functions. Cats have claws to survive through violence. Even your housecat, whose only reason for not eating you is that you're too large, can do you serious damage.

For function, it may be better to see a cat's paw as a stapler, switchblade or mousetrap. Two of those are made to pierce. Two of them are spring-loaded. All three remind us of what a claw does.

HOMEWORK ASSIGNMENT

Horse legs

Collect a dozen photographs of horses that include their shoulders and forelimbs. The images can be low-resolution – in fact, that's an advantage, as it will keep you from being tempted to copy surfaces. Try to draw the wedge form of the shoulders, the block form of the carpal mass, and the ball-and-shaft fetlock joint. When you can do it successfully, move to the next great challenge – draw the shoulders and forelegs in a new, unseen position. To master forelegs, you master their forms.

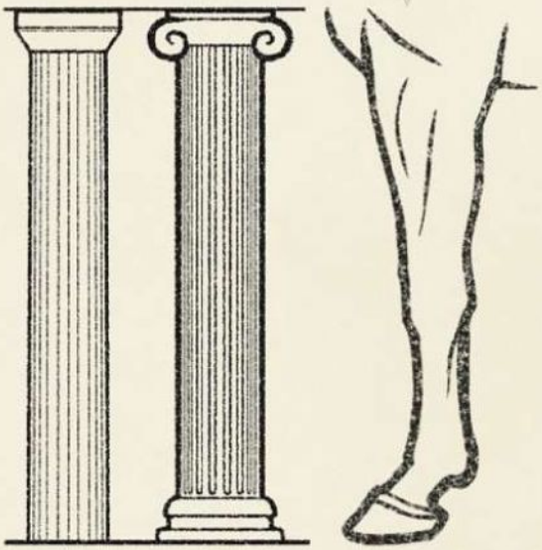
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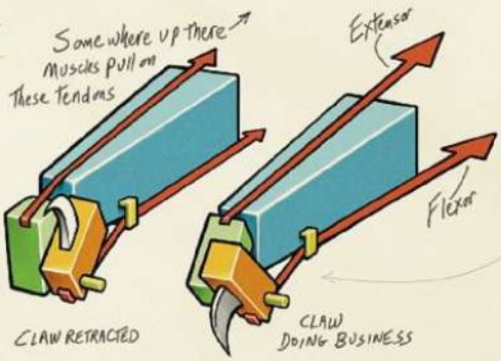
FORELEG FUNCTIONS

FORELEGS SUPPORT, CUSHION A FALL, WALK, SPRING, SCRATCH, POUND...

A strong support for shoulders

The first Greek columns had no pedestals: they just went straight into the base. As they evolved, they were given feet.

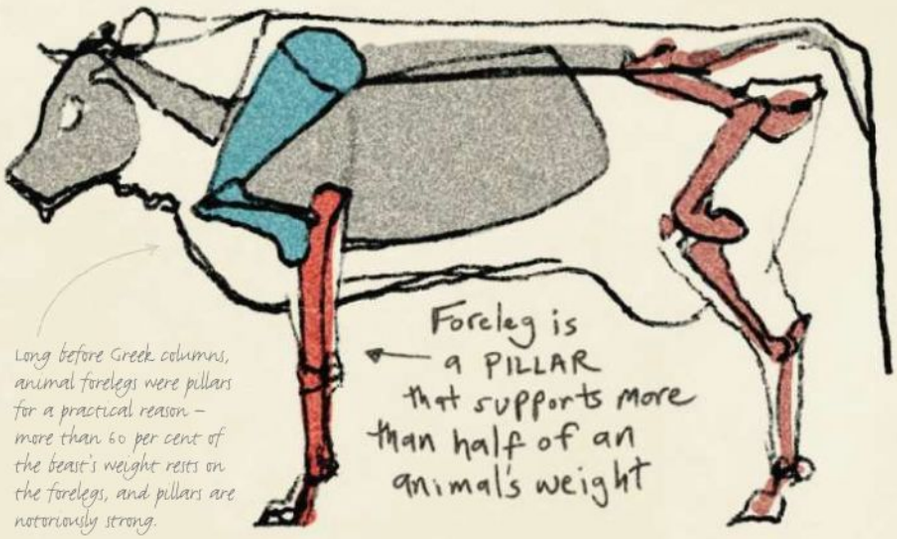




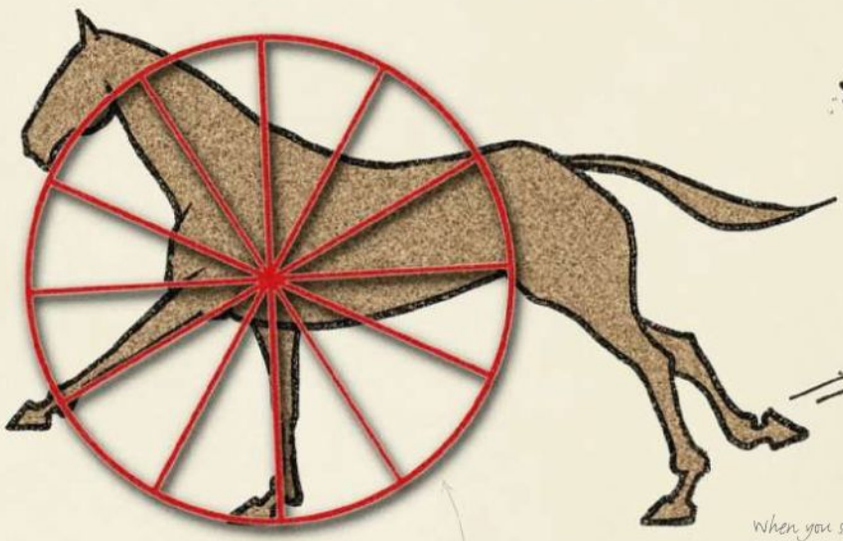
The piercing

Claws spring out of paws to pierce prey. But if muscles can only pull, how can they project a claw out and away from the body? It takes both extensors (to pull back the phalanx, or finger bone) and flexors (to pull down the claw) working together to reach and grip. This diagram shows how it's done.

Once you know how a cat claw works, you can forget it and design as you like. But you mustn't forget the function: a claw is a set of knives to impale, or a spade to dig, or a hook....



Long before Greek columns, animal forelegs were pillars for a practical reason – more than 60 per cent of the beast's weight rests on the forelegs, and pillars are notoriously strong.





Forelegs have functions: pillars, spokes, hooks, knives, blades and spades, wrenches and pliers, clamps, vices, weapons, shields, paddles, cups and bowls...

Your job is not to copy what you see, but to understand what you see – and to use your skills to create whatever you choose.

When you see a hoof as a form, you can draw it with spatial credibility. When you see it as a shoe or a cleat or a spike or a sledgehammer, though, you can exaggerate it with meaning.

From pillars to spokes

Pillars stay put. Spokes revolve and provide a consistent strong support for a turning wheel – the same as a straight foreleg in an animal galloping at high speed.

PART 5

NECKS AND HEADS



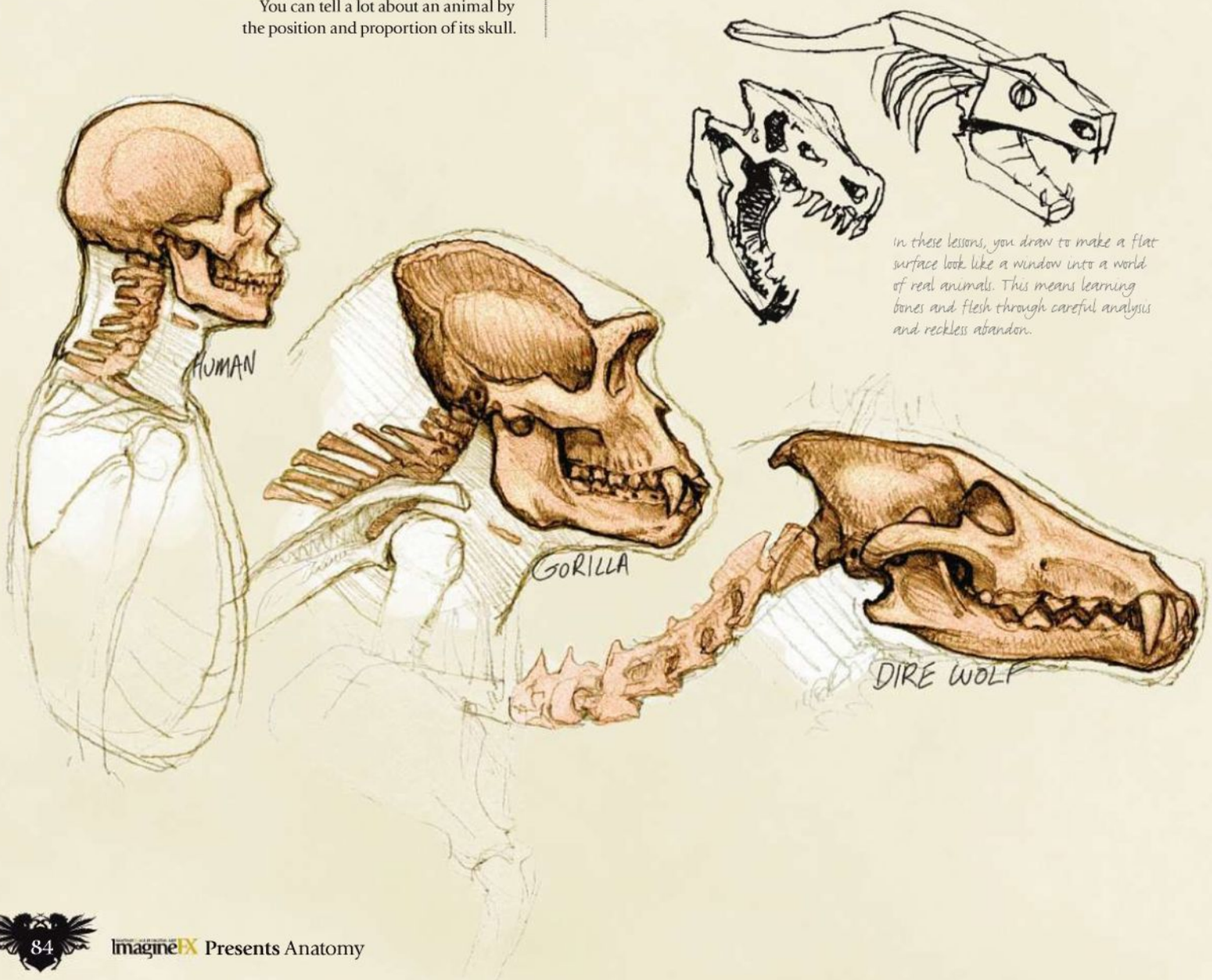
Discover what this part of the animal body tells you about the creature – and the traits all animals share

We try to make animal anatomy easier by comparing animals to humans. Unfortunately, many artists barely know human anatomy. Robert Beverly Hale pointed out that an artist who knows human anatomy can learn animals relatively easily. Part of the emphasis should be on 'relatively': it's still something of a task. But the most efficient and fun way is indeed to see creatures as people who run around on all limbs, noses forward, fast and strong.

You can tell a lot about an animal by the position and proportion of its skull. Human heads rest on our necks because we stand upright, and we have large craniums because we rely on our brains. Apes have smaller brains and greater jaws; and because they lean forward on their knuckles, their skulls sit slightly forward from their necks. Quadrupeds are horizontal – their skulls extend from their bodies.

From these basic conditions, skulls vary according to an animal's need to survive and thrive. Cats, for example, have alarming eyes and teeth. Wolves have incredible noses and teeth. But the big differences between animal and human heads are that animals have a snout that leads, and their brains, rather than being on top of their heads, are more towards the back. They hunt and run. They graze. They don't read magazines or draw pictures or concoct fantasy worlds and write them down to enchant others.

In this chapter, you'll study head structure – but we begin with how necks emerge from the torso, and hold heads that face the world.



In these lessons, you draw to make a flat surface look like a window into a world of real animals. This means learning bones and flesh through careful analysis and reckless abandon.

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THE NECK BONES

MOST NECK BONES ARE DEEP AND HIDDEN, BUT THEY AFFECT THE SURFACE WHEN ANIMALS MOVE...

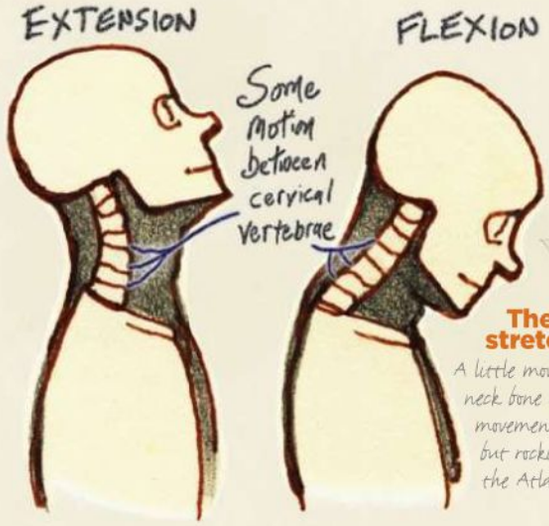
HOMEWORK ASSIGNMENT

Get familiar with the neck

Treat the neck bones as a simple line, beginning low, usually with a bit of an 'S' to the curve. When you can see the core of the neck, you know what parts of the flesh squash, and which parts stretch.

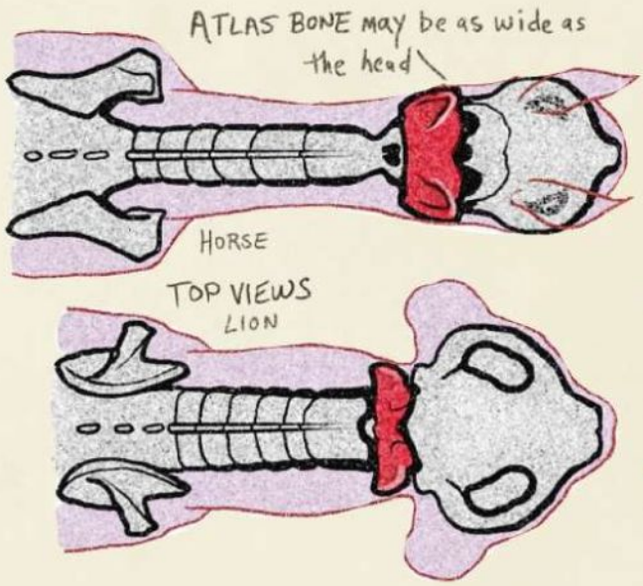
Mice have seven neck bones. So do giraffes. So do humans. So do almost all mammals. They're called cervical vertebrae. In a human, the top one (that's C1, for Cervical 1) is so deep it can't be seen, but in many animals it spreads out near the head and can be felt on the side, behind the ears. It's also known as the Atlas bone. It's wide, and may even look like part of the head.





The stretching neck

A little movement between each neck bone adds up to a lot of movement for the whole neck, but rocking motion happens at the Atlas bone.

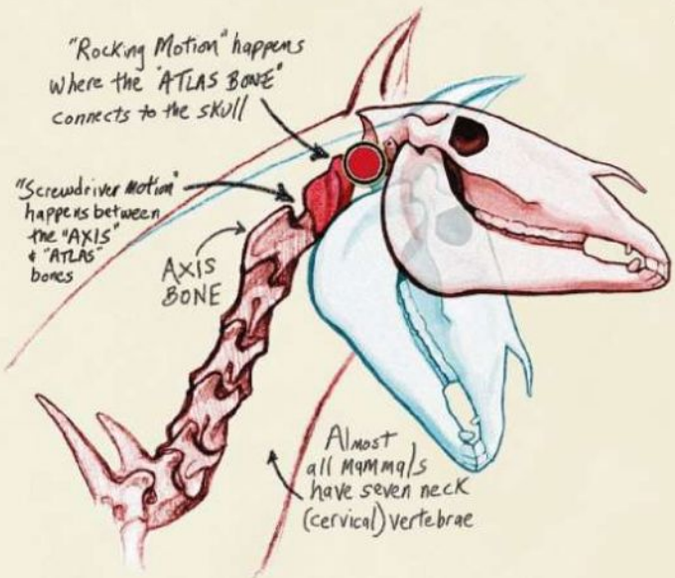


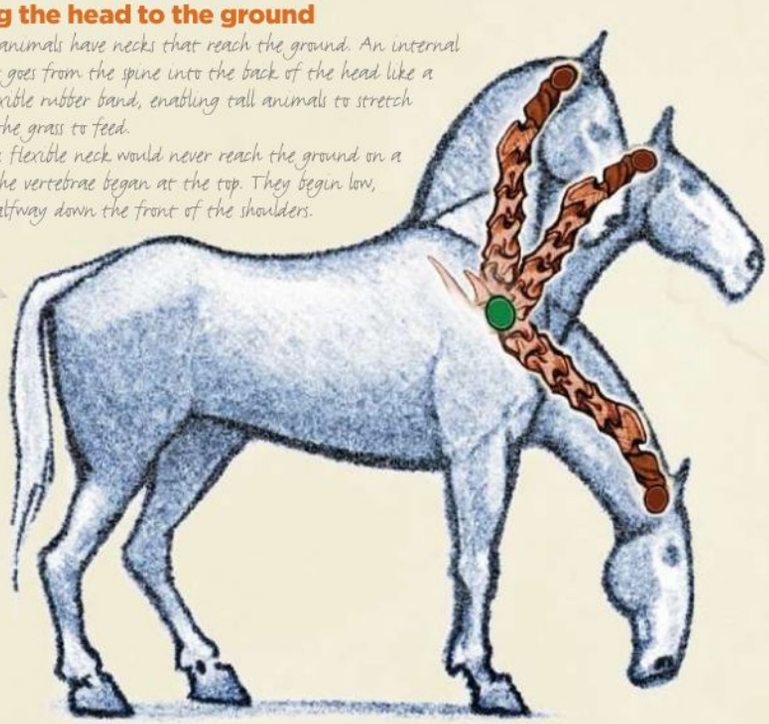


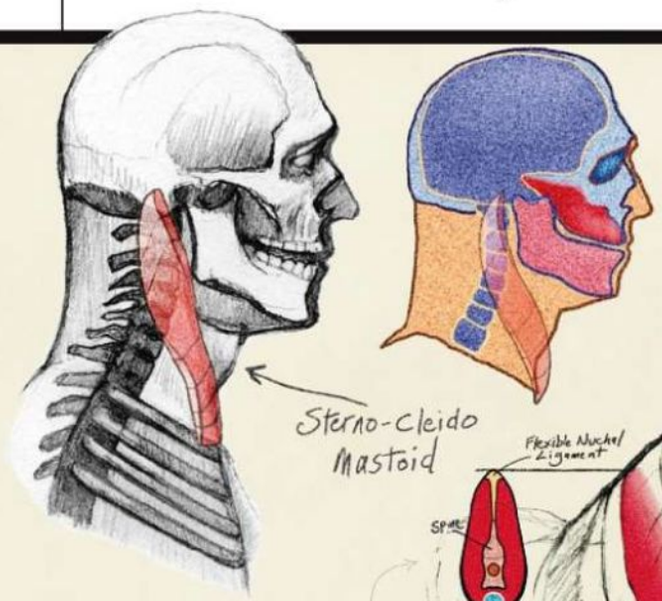
Taking the head to the ground

Grazing animals have necks that reach the ground. An internal ligament goes from the spine into the back of the head like a large, flexible rubber band, enabling tall animals to stretch down to the grass to feed.

Even a flexible neck would never reach the ground on a horse if the vertebrae began at the top. They begin low, almost halfway down the front of the shoulders.





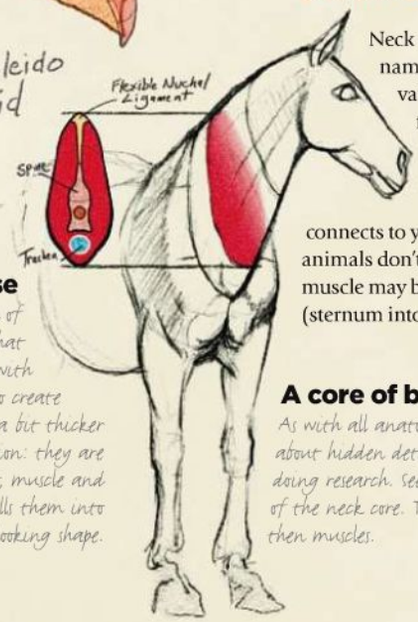


ANATOMY AND FORM OF THE NECK

LEAVE COMPLEX NECK ANATOMY TO THE VETERINARIAN – ARTISTS CAN SIMPLIFY NECK FORMS FOR THE INFORMATION THEY NEED...

Neck muscles have inconsistent names because the structures vary. The muscle that goes from your collar bone to the bump behind your ear is the sterno-cleido mastoid. Cleido refers to the part that connects to your clavicle – but most animals don't have clavicles, so that muscle may be called the sterno-mastoid (sternum into mastoid process) or the cephalo humeral (from head to humerus) or other variations.

The names must not bog you down from your concerns. Let's look at what animal necks have in common that artists need to know.

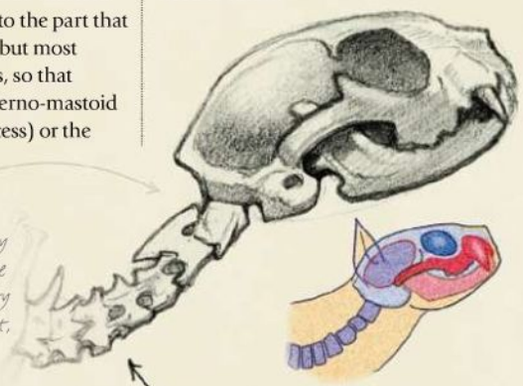


A shoulder base

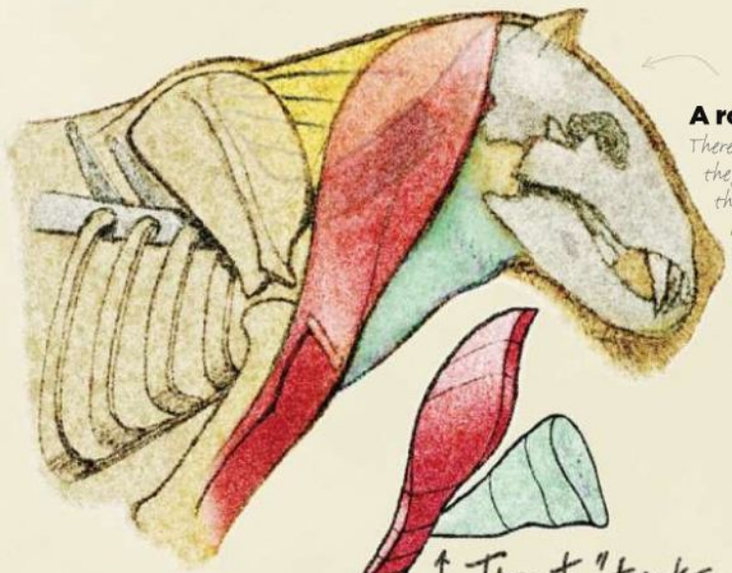
The torso is the foundation of the neck, which means that it's usually best to begin with the forms of the shoulder to create a neck. Necks are usually a bit thicker toward the base in cross-section: they are mostly tissue (ligament, muscle and fat), so gravity pulls them into a slightly teardrop-looking shape.

A core of bones

As with all anatomy, don't worry about hidden details unless you're doing research. Seek the simplicity of the neck core. That comes first, then muscles.

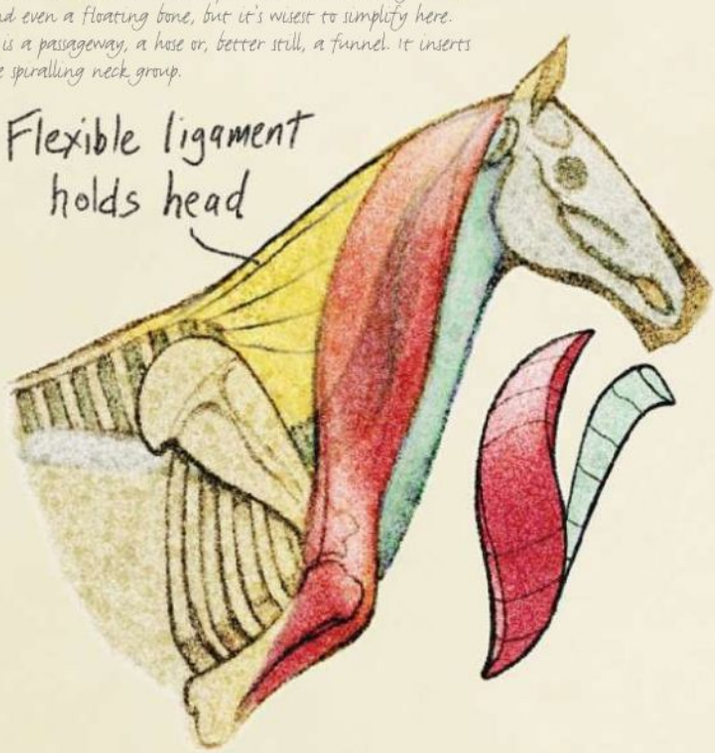


The little gnarls on neck vertebrae are complex... & won't help you draw necks



A rotator set and a throat network

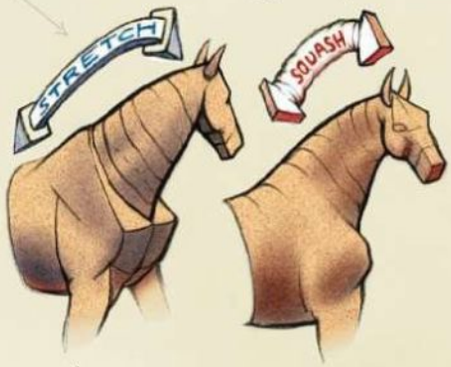
There are many neck muscles that overlay each other. The most assertive is the group (with varying names) that spirals from behind the ear into the shoulder point. The throat is made up of muscle, tendon, ligament, cartilage, and even a floating bone, but it's wisest to simplify here. The throat is a passageway, a hose or, better still, a funnel. It inserts between the spiralling neck group.



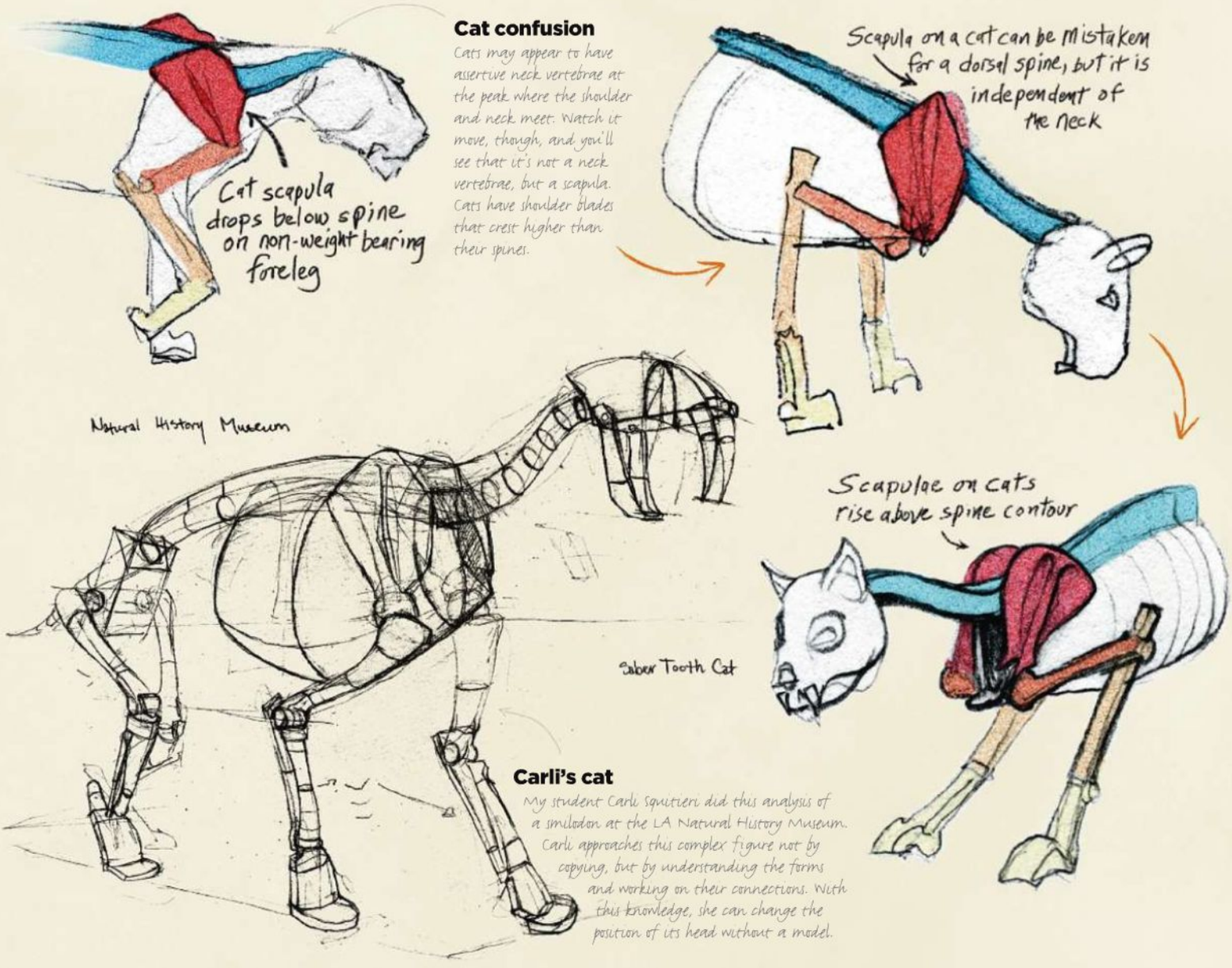
↑ Throat "tucks into" rotator group

Squash and stretch

You can see the animator's principle of squash and stretch most obviously at the neck. When a horse turns its head to look behind itself, one set of side muscles contracts, while the other side relaxes.



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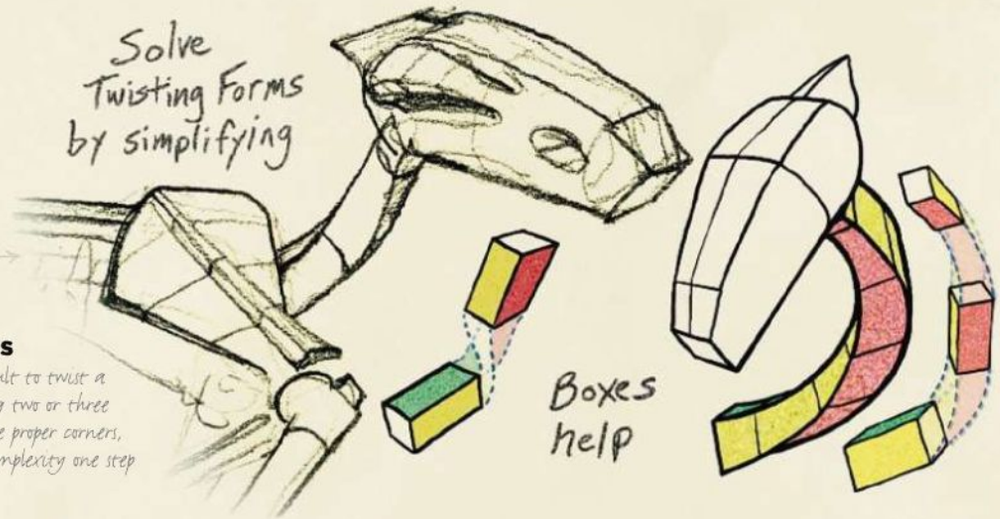


Cat confusion

Cats may appear to have assertive neck vertebrae at the peak where the shoulder and neck meet. Watch it move, though, and you'll see that it's not a neck vertebrae, but a scapula. Cats have shoulder blades that crest higher than their spines.

Carli's cat

My student Carli Spitteri did this analysis of a smilodon at the LA Natural History Museum. Carli approaches this complex figure not by copying, but by understanding the forms and working on their connections. With this knowledge, she can change the position of its head without a model.



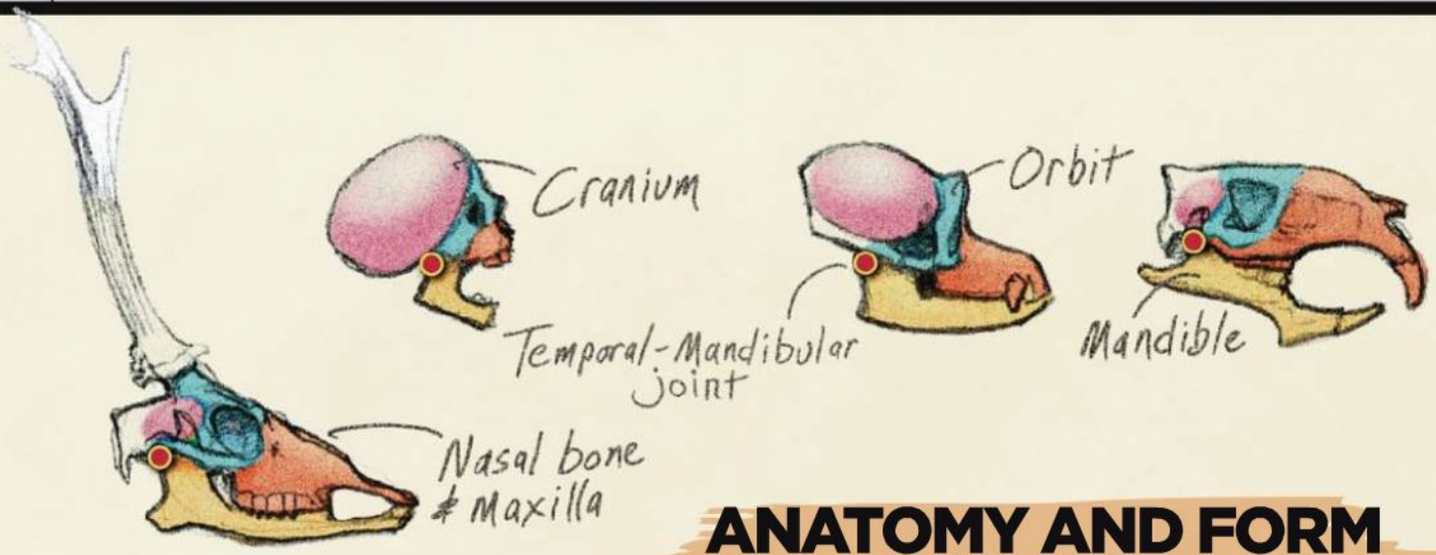
Twisting necks

If you find it difficult to twist a form, begin by placing two or three box forms. Connect the proper corners, and you'll solve the complexity one step at a time.

HOMEWORK ASSIGNMENT

Turn skeletons to architecture

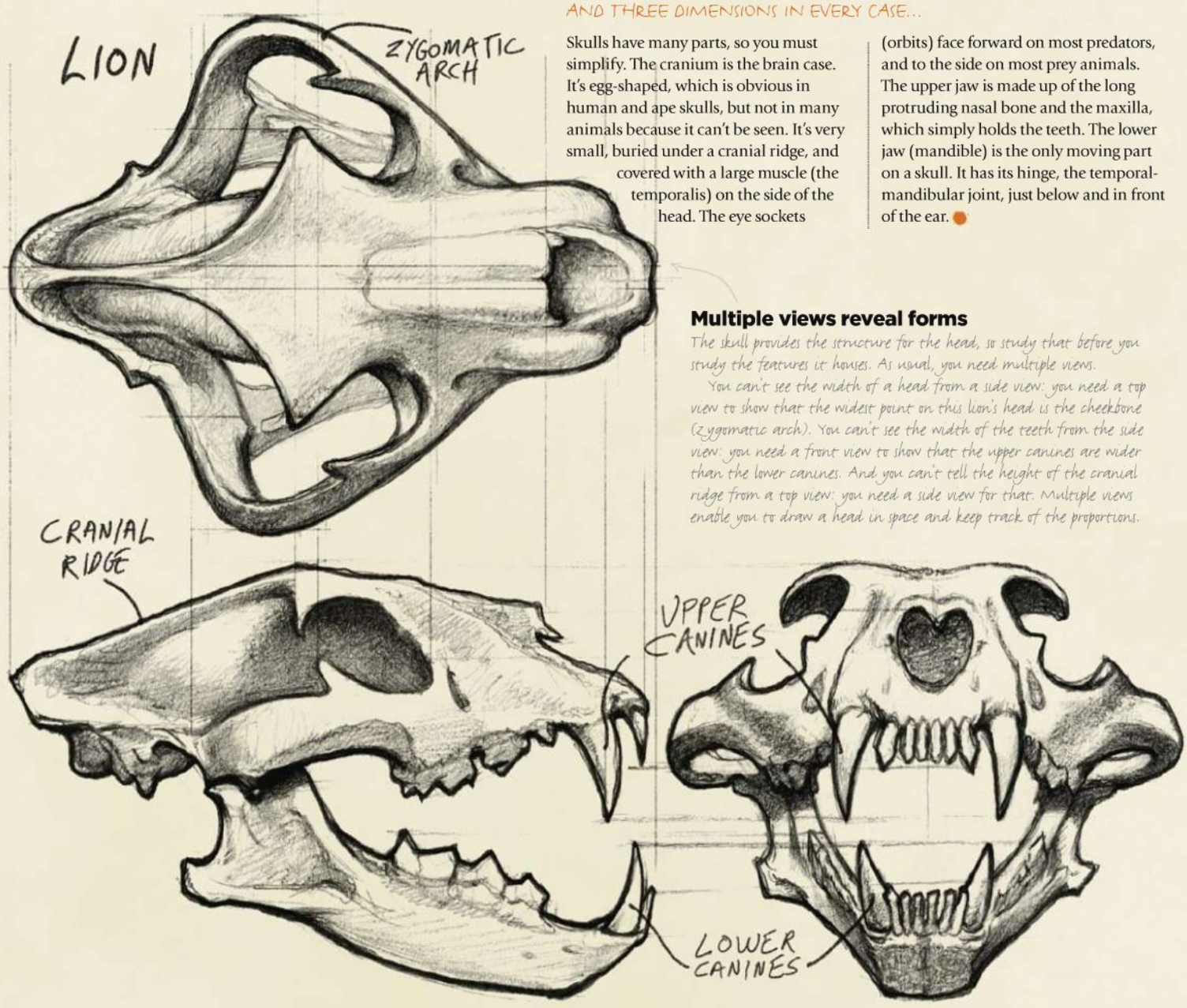
You can almost guess this assignment, as I recommend it all the time: reduce animal skeletons to architecture, like Carli did in the sample on this page. It's the great challenge of draftsmanship, and will help you understand hidden neck anatomy. A twisted pipe is a useful analogy for animals with flexible necks that can look behind themselves.



ANATOMY AND FORM OF THE HEAD

ANIMAL HEADS HAVE MANY VARIATIONS, A FEW COMMONALITIES – AND THREE DIMENSIONS IN EVERY CASE...

Skulls have many parts, so you must simplify. The cranium is the brain case. It's egg-shaped, which is obvious in human and ape skulls, but not in many animals because it can't be seen. It's very small, buried under a cranial ridge, and covered with a large muscle (the temporalis) on the side of the head. The eye sockets (orbits) face forward on most predators, and to the side on most prey animals. The upper jaw is made up of the long protruding nasal bone and the maxilla, which simply holds the teeth. The lower jaw (mandible) is the only moving part on a skull. It has its hinge, the temporal-mandibular joint, just below and in front of the ear.

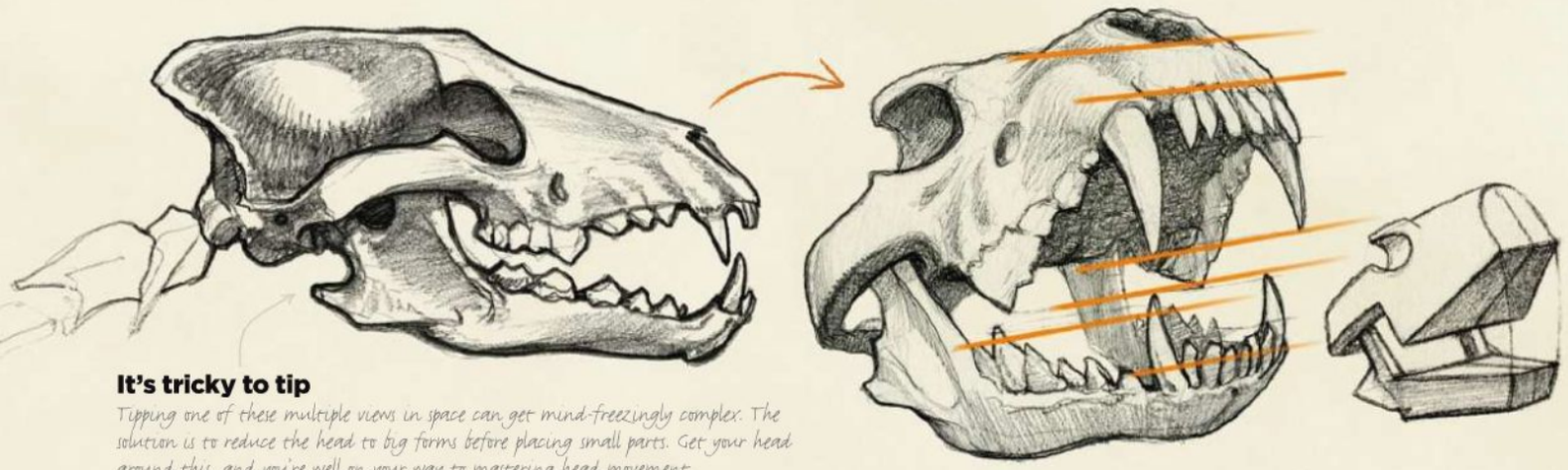


Multiple views reveal forms

The skull provides the structure for the head, so study that before you study the features it houses. As usual, you need multiple views.

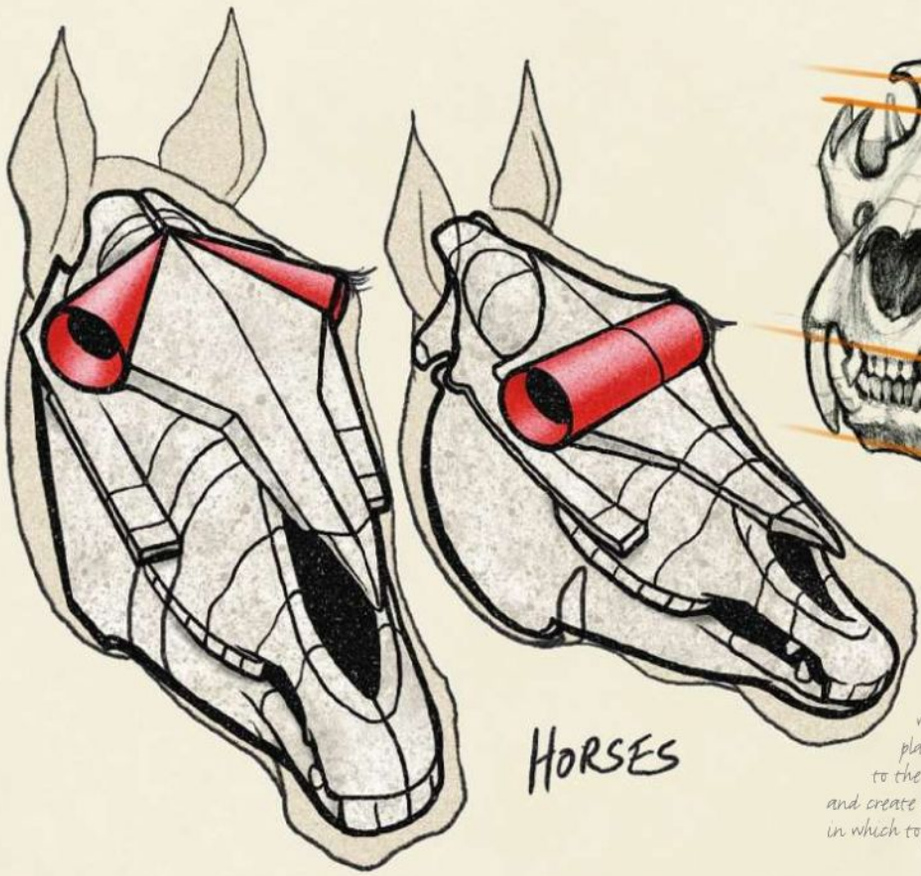
You can't see the width of a head from a side view: you need a top view to show that the widest point on this lion's head is the cheekbone (zygomatic arch). You can't see the width of the teeth from the side view: you need a front view to show that the upper canines are wider than the lower canines. And you can't tell the height of the cranial ridge from a top view: you need a side view for that. Multiple views enable you to draw a head in space and keep track of the proportions.

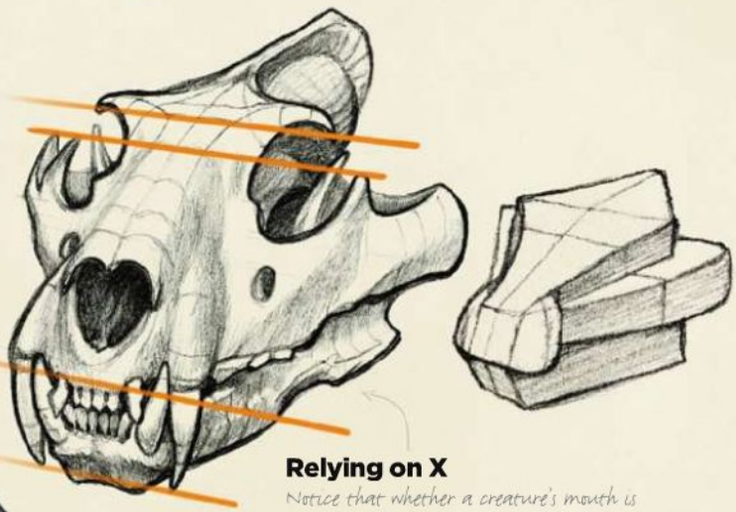
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It's tricky to tip

Tipping one of these multiple views in space can get mind-freezingly complex. The solution is to reduce the head to big forms before placing small parts. Get your head around this, and you're well on your way to mastering head movement.





Relying on X

Notice that whether a creature's mouth is open or closed, the X lines (shown here in orange) always stay consistent. That can help you when you're working on a fleshed creature's head and you need to locate the distant canine.

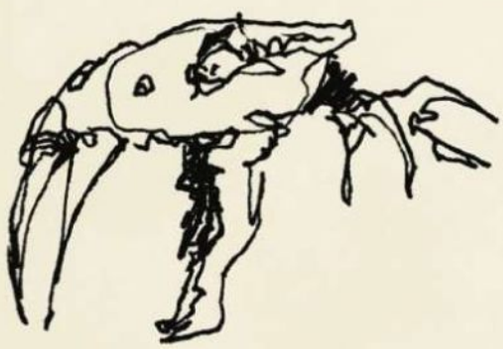
Placing eyes

The eyes on prey animals look out to the side – sort of. If it was that simple, a cylinder across the skull would solve their placement. On most prey animals, the eyes are not completely out to the side, but aimed slightly forward. If you place a centre point and create two cones diverging from that centre, you have a structure in which to place eyeballs.



Take the antidote

All this analytical work is necessary for mastery, but it's not the end of it. When you've studied anatomy enough to control the forms you create, don't forget to take the antidote for finickiness. Draw fast; draw recklessly; draw for fun. You may do your best work when you let go of your intellect and follow your impulses.



PART 6

ANIMAL FACES

Find out what animal faces have in common with human faces, and the crucial ways in which they differ



Artist PROFILE

Marshall Vandruff
COUNTRY: US

Take a trip to Marshall's website for more info
www.marshallart.com

On the disc
Find sketches by Marshall in the Animal Faces folder inside Animal Anatomy

We began this animal workshop with basic forms, then worked from the torso to the hind legs, forelegs, neck and head. We now finish with the the most emotive and expressive entity in life: the face. When William Blake wrote:

Tyger! Tyger! burning bright
In the forests of the night,
What immortal hand or eye
Dare frame thy fearful symmetry?

...He put into words a mystery that has haunted people ever since we began observing the world – the fact that living phenomena come to us in mirrored halves. Faces are essentially symmetrical. If they were simply flat, artists would still need perspective to represent them in three-quarter views tipped away from us. But they are far from flat: they are made of several 3D components, like a puzzle of sculpture.

To draw faces from any position other than head-on, and even to draw them head-on if you want them to look credibly solid, reduce them to simple forms based on anatomy. Then, when you have a solid structure, find expression: glorious, fearful, attractive or amusing symmetry.

As in previous chapters, we begin here with technical lessons – including how perspective applies to the structure of a skull and how features themselves are made of three-dimensional forms – but we are heading toward a common artistic purpose: to create pictures that channel feeling. Heads display faces – our final study of animal anatomy.



This is a pencil drawing of a face that bothered me for a few weeks. Now it's safely imprisoned on paper, and gives me little trouble.

Draw from life

Short of a model or volunteer for a life drawing session? Visit a zoo or wildlife park with your sketchbook, and you'll find plenty of willing subjects. Mix spontaneous scribbles with more in-depth studies.





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UNDERLYING STRUCTURE

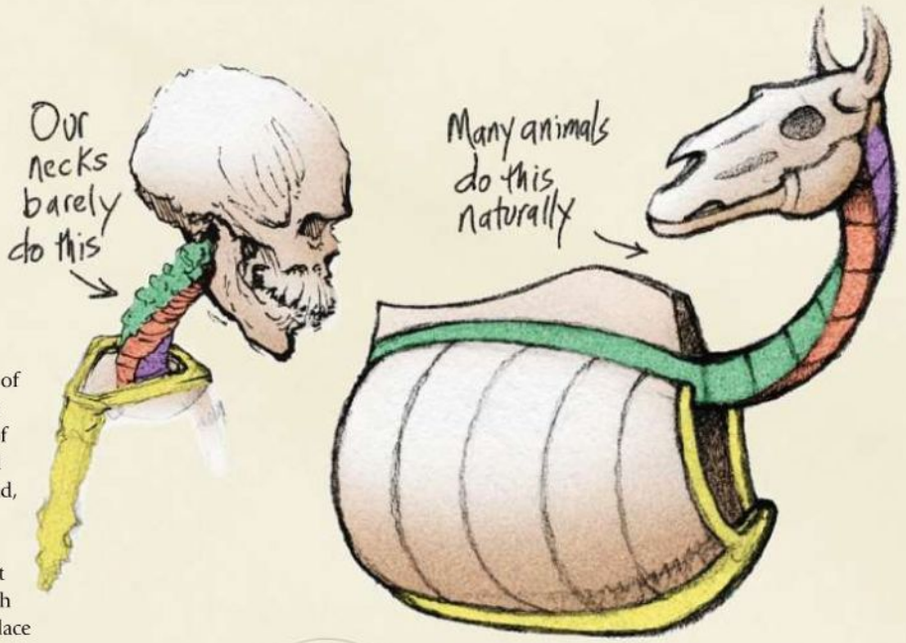
NECKS HOLD HEADS, AND HEADS HOLD FACES. LET'S REVIEW BASIC STRUCTURES...

HOMEWORK ASSIGNMENT

Box clever to carve a head

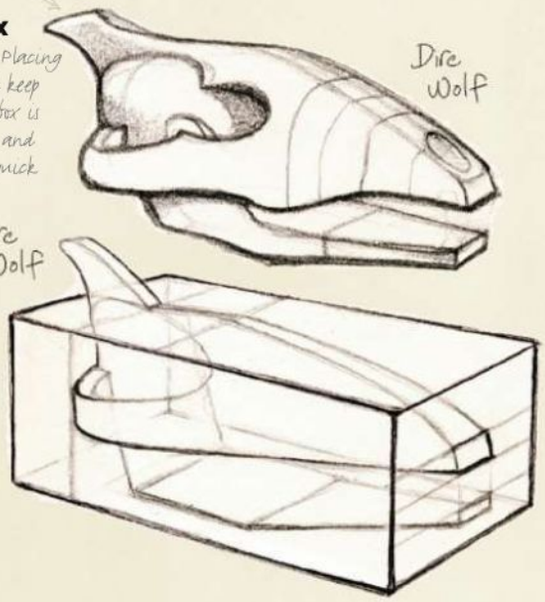
Choose two views of an animal head. Draw the simplest box into which each will fit. Then try carving out sections to leave the remaining form of the head.

Bones provide the hidden structure of the body – most obviously with the head, where the skull makes most of the form. There are many small and interesting parts on an animal's head, but no matter how perfectly a nose, an eye or even an expression is drawn, it looks awkward if it doesn't fit onto the skull. So we'll begin with simplifications that enable you to place features where they belong.



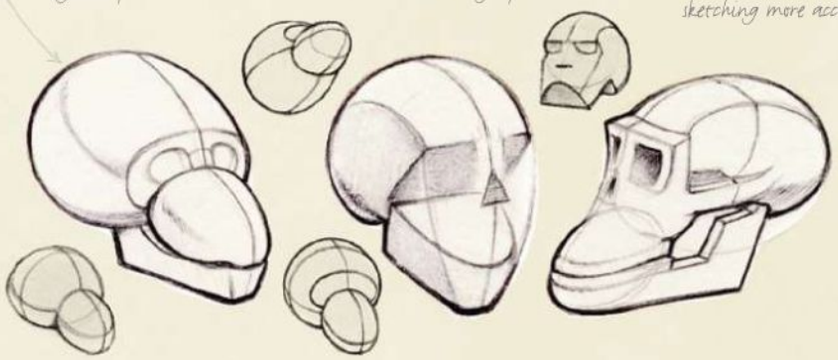
Thinking inside the box

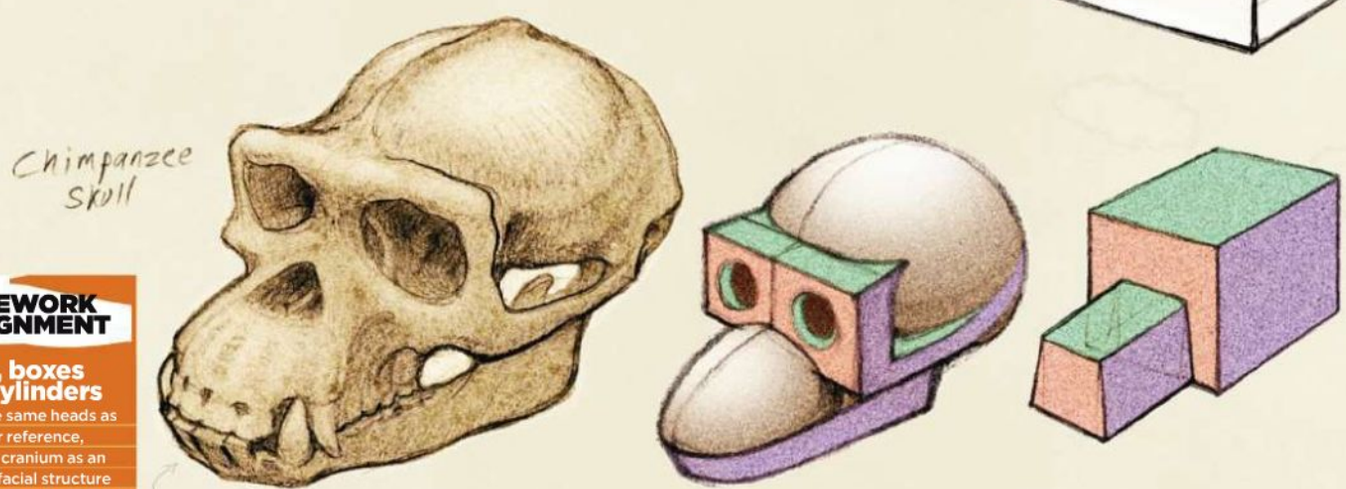
Skulls are complex; boxes are simple. Placing a complex form into a box helps you keep track of width and depth lines. A box is scaffolding for precise construction, and tracking the lines can make your quick sketching more accurate.



Useful reductions

Here are simplifications of monkey, human and chimp skulls. Reducing them to their structural foundations enables you to tilt a head into many new positions, where reference is locked into a single position.





HOMEWORK ASSIGNMENT

Eggs, boxes and cylinders

Using the same heads as above for reference, draw the cranium as an egg, the facial structure as a box or cylinder, and the eye sockets as cylinders or cones. All of this is preparation for features. Always build the house before you start hanging curtains...

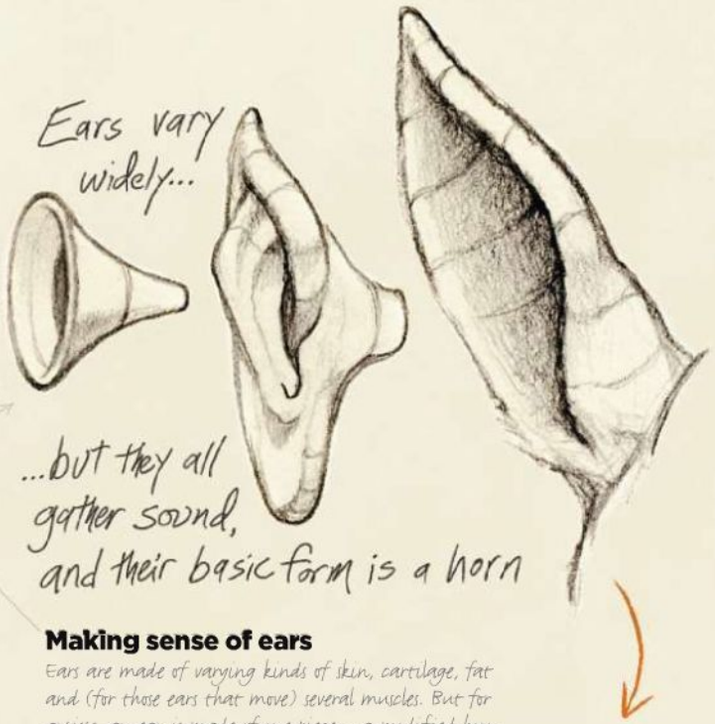
Forms first

Pay all the attention you like to bumps and gnarls and details. It'll mean that your drawings will impress people, but it may distract you from the basic structure that you must master first. If considering a head as a box, a ball or an egg seems too simple, wait until you try: it's a difficult but rewarding task. Difficult because the mastery of basic forms may take months of study; rewarding because the hidden structure of skull forms affects the position of every detail on an animal's head.

THE FORM OF FEATURES

EYES, EARS, NOSES AND MOUTHS HAVE REMARKABLE VARIETY, AND A COMMON SOLIDITY...

Features are not painted on like colours or textures. They have their own shapes and thicknesses. Here are some observations to help you see them not as surfaces, but as smaller forms within bigger forms.

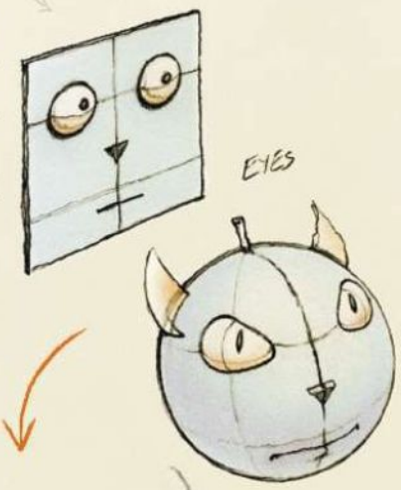


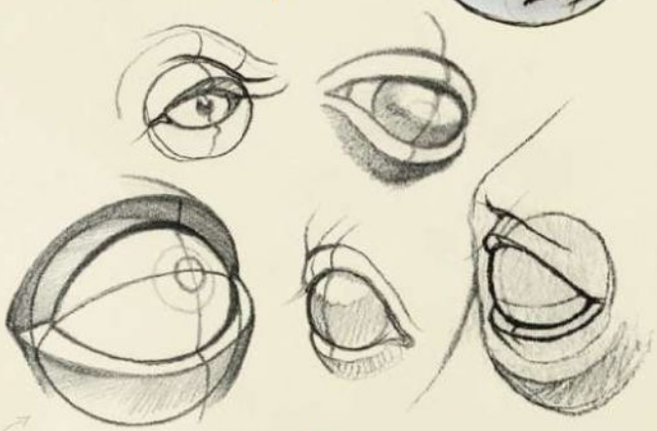
Making sense of ears

Ears are made of varying kinds of skin, cartilage, fat and (for those ears that move) several muscles. But for artists, an ear is made of one piece – a modified horn that is used to gather sound.

Thick, not flat

When eyes are on a flat plane, as they (almost) are on humans and apes, that simplifies foreshortening. But on animals with round heads, the distant eye wraps around the roundness of the skull.





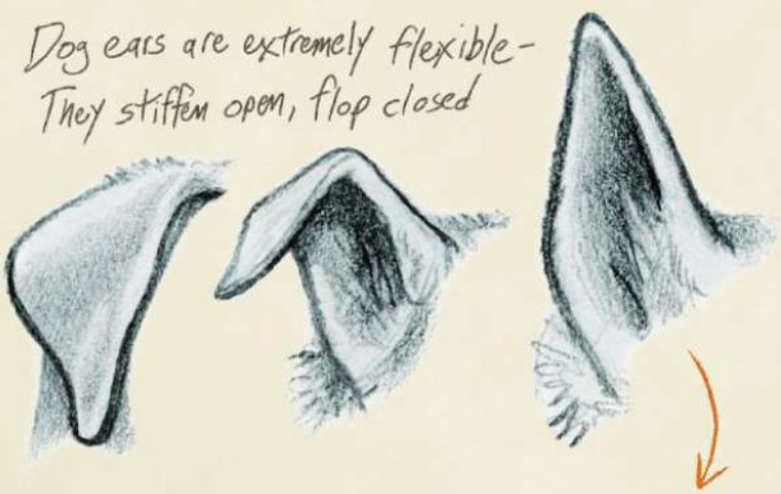
Eye as ball

All eyeballs are spheres. The lid is a sheath, usually rather thick, that wraps around the ball.

Curved surface

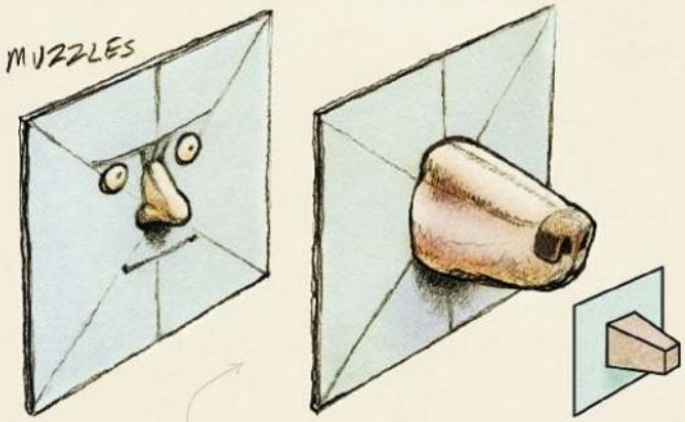
Even though most of the eyeball rests in the socket, the surface is still curved. Get this curve pegged before rendering.





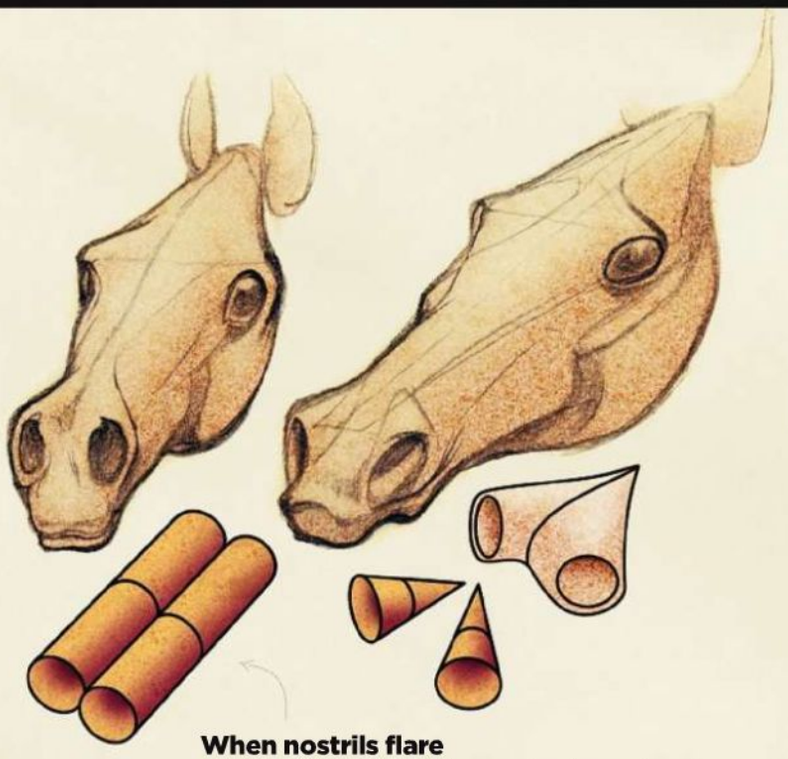


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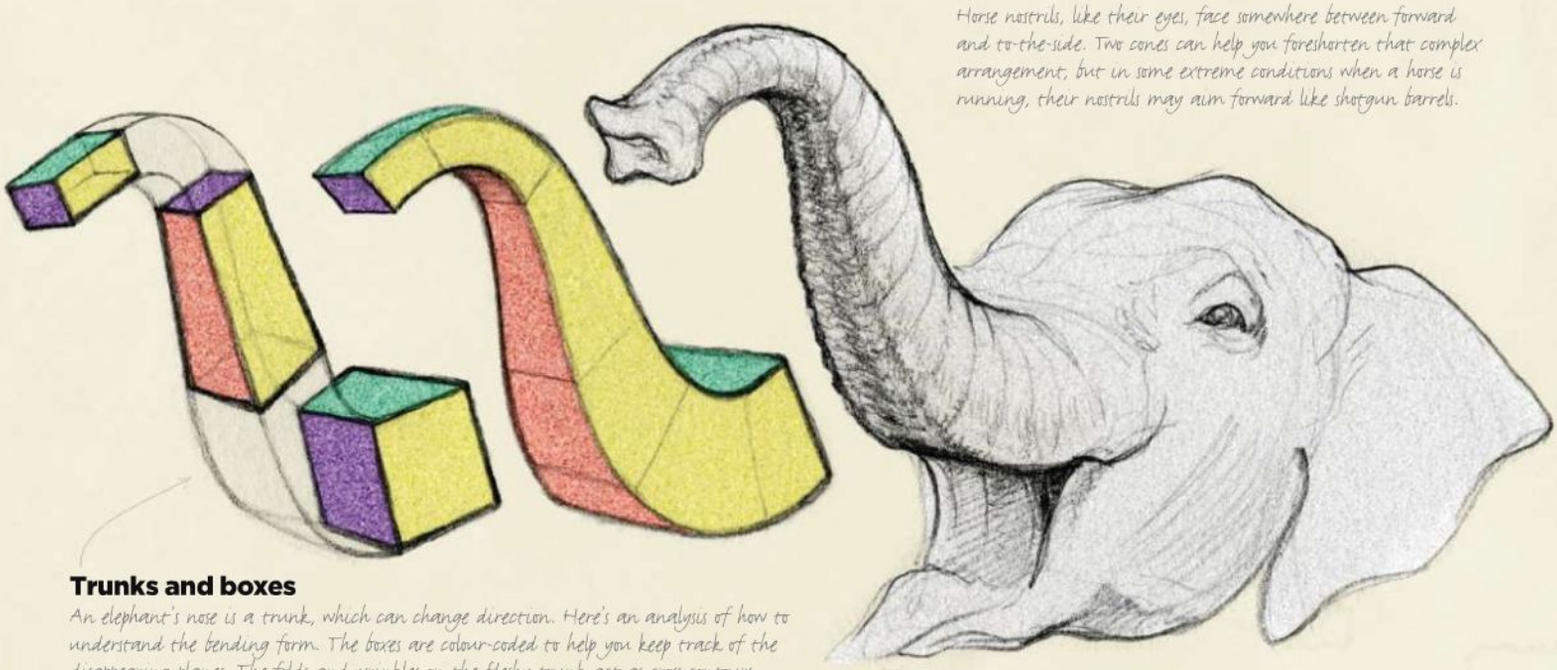
Snouts stick out

Our noses are measly compared to most beasts – the muzzle of an animal's nose and mouth projects forward. It helps to see it as a cylinder or a box. When a muzzle is in a three-quarter position, the planes with details, like jowls or nostrils, will give you a three-dimensional map to help you conform the details to the structure.



When nostrils flare

Horse nostrils, like their eyes, face somewhere between forward and to-the-side. Two cones can help you foreshorten that complex arrangement, but in some extreme conditions when a horse is running, their nostrils may aim forward like shotgun barrels.



Trunks and boxes

An elephant's nose is a trunk, which can change direction. Here's an analysis of how to understand the bending form. The boxes are colour-coded to help you keep track of the disappearing planes. The folds and wrinkles on the fleshy trunk act as cross-contours – perspective lines that define the thickness all along.



Jaws as hinges

Jaws are simple from the side: they're hinge joints. From other angles, they may appear quite triangular – wider at the back and narrow at the front. You must find an area where the side and front of the mouth meet to make a change of planes. In three-quarter views, canines make a convenient break, acting as front corners of the jaw.

HOMEWORK ASSIGNMENT

Compare and contrast

Gather reference of animal faces, and draw them as people. The most common surprise is how small human muzzles seem compared to animals. Seeing the difference helps you notice the forms.



ANIMALS AS PEOPLE

HUMANS AND BEASTS HAVE THE SAME PARTS IN VARYING PROPORTIONS. LET'S COMPARE...

Socially, it might not be a good idea to compare your friends and family with animals. Artistically, it's a very good idea if you want to understand facial features. There are so many variations of animal features that it could take a career to learn them all. Comparisons are the most efficient shortcut, and the most fun – as long as they don't end up in hurt feelings or violent responses.

These metamorphoses, courtesy of **www.banedarkart.com**, make the point.

Precious piglet

Sometimes a human face inspires an animal: a monkey, a mouse, a kitten, a cub, a weasel, a chimpanzee. After all, what is a child but a talking animal?



Big bear aspirations

If you lack for ideas when creating characters, or if you find yourself in a rut creating the same human character over and over, try using animal faces for inspiration. They can prompt universal and unique people-types.



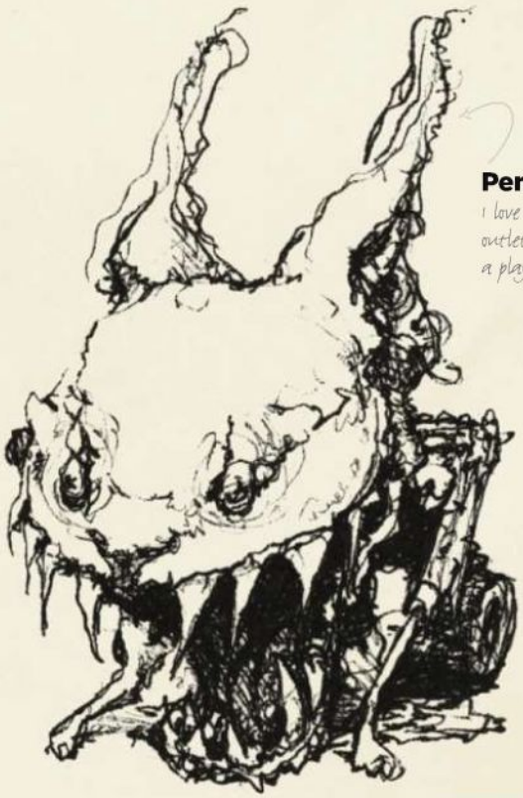
HOMEWORK ASSIGNMENT

Morphing magic

Try painting a morph between an animal and a human face, like Bane has in his studies on this page. The challenge – and the learning – happens during that transition stage in the middle illustration.



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Pencil head

I love to draw: it's an outlet for feelings and a playground for ideas.





Draw stuff you like

Whatever talent you have, you can only bring it out with practice. The more enjoyable the practice is, the more likely it is that you'll keep at it.



EXPRESSION IS THE KEY TO THE FACE

THE FACE IS THE CROWNING COUNTENANCE, SO GETTING THE EXPRESSION RIGHT WILL GIVE YOUR DRAWING LIFE AND MEANING...

It doesn't take a trained artist to draw an animal face. Children do pretty well – not because of their skill, but because of their emotional connections to faces. Most children, however, hope to have the grown-up skills that we've studied in these six workshops.

Technical skill helps you understand anatomy, so that you can keep the bones hard when the flesh stretches. Technical skill helps you understand forms so you can point a snout toward or away from you, or exaggerate a creature into absurdity, yet keep it looking real.

Technical skill is useful for anyone who makes a living at creating animals, but it's only the structure – the heart and arteries. By itself, it's dead. Emotion is the blood.

Get to it!

With all the variety of animals to invent, a lifetime doesn't seem quite long enough...

Animal faces evoke feelings. Their mystery, strangeness, terror and splendour are more marvellous than we could ever imagine on our own. The more you feed your imagination, the more you can reflect their power in your work.

I hope these pages have helped you to draw animals, and inspired you to give your viewers the best you have to offer!



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Digital art skills

Support files for these guides are on the disc

Expert advice from professional artists, written especially for you



> It extends and energises your character's personality

Warren Louw on posing figures: page 104



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Workshops

The sort of advice you'll find in every issue of ImagineFX…



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Combine human and animal anatomy to create a fine-art portrait of a monster with Justin Gerard



102 Top ten fantasy poses
Whether you're drawing a hero or a villain, we've got the gestures and silhouettes to help you out



104 Strike a pose
Warren Louw explains how to fill your characters with energy by learning the art of posing



108 Artist Q&A
Our artist panel solves real-world anatomy issues, including painting realistic hands and drawing eyes



108

Photoshop

CREATURE FEATURES

Combine human and animal anatomy to create a fine-art portrait of a monster with **Justin Gerard**

Let's assume that you've been approached by a wealthy monster who wants to commission you to paint its portrait. (Unlikely, perhaps, but I've had stranger requests.) Let's say that he feels he's been misrepresented in film and literature, and unjustly categorised on the whole. He wants to commission you to execute his portrait, to show the world that he is really a civilised and noble creature at heart.

The following demonstration in watercolour and digital will help you deal with just such an event. After all, it pays to be prepared, just in case.

I'll be doing an underpainting in watercolour and scanning the image onto the computer, where I'll add the colours, refine the lighting and work on the final details in Photoshop.

Artist PROFILE

Justin Gerard
COUNTRY: US



Justin Gerard is an illustrator who enjoys story-driven illustration. His work has been featured in Spectrum, Society of Illustrators and Exposé, and he is currently art director for Portland Studio.
www.justingerard.com

On the disc

Find Justin's screen grabs in the Creature Features folder inside Digital Art Skills



1 Drawing from life

Before I begin working on my monster, I warm up by doing studies from life. In this case, I'll be using pictures of wild animals as reference.

The goal of these studies is to form a better understanding of the elements and characteristics of my subject matter. Wild animals are excellent reference for monsters, because they personify human characteristics taken to extremes.

I don't spend too long on any one study. The goal is to commit the forms and details of these creatures to memory, so that I can work from my imagination without the aid of reference.



2 Thumbnails and exploratory work

Now I throw out all of my reference and burn my studies, and start drawing completely from my head. I'll use my reference later, but for the time being, I want to work completely from my memory and imagination.

I work quickly, using either ballpoint pen or a 0.7mm HB (number 2) pencil. This drawing is often the most fun for me. The possibilities of what could be are almost always more interesting than what is, and I try to get down as many ideas as I can. Eventually there are 20 or so two- or three- inch monsters to pull from.



3 Tight sketch

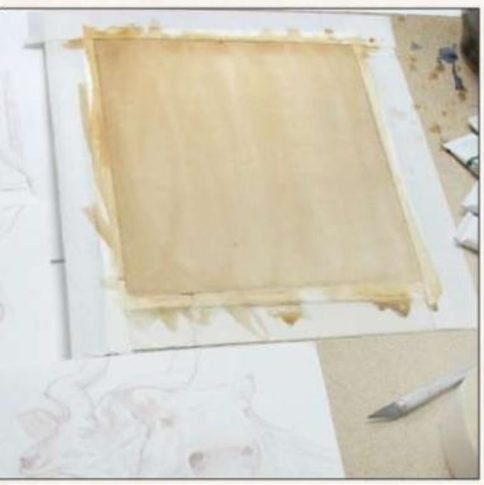
This particular monster looks promising. I now do a more careful, detailed drawing using a General's 2B pencil. I spend as much time as is necessary on this step to arrive at the right look. The drawing is the most essential element if an illustration is to succeed. There are ways to finish an illustration from a poor drawing, but it would be like wrestling a baboon into a lunchbox.

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4 Adjusting proportions

Now that I have a sketch that I'm pleased with, I'm ready to transfer it to my watercolour paper. Before doing this, there's one devilish little trick that I use that has totally reinvented my work. I scan the drawing into Photoshop, mirror it and adjust it before I print it back out and transfer it to paper. This minor readjustment often spells the difference between glorious success and miserable, shivering failure. Before adding this step, all my pieces had an odd tendency towards disproportion and unbalanced composition. So after I mirror the image, I select areas that don't look right and, using the Transform function, alter them until they look right, before flipping back.



5 Setting up the watercolour

Now I leave the computer and turn to setting up my watercolour. For this illustration, I'll be using Strathmore 500-series Bristol and working at 8.5 x 9.5in. This Bristol is an excellent paper that can take a lot of abuse, and enables precise linework. For this piece, I want to tone my canvas before I transfer my sketch to it. One of the strengths of working digitally over a watercolour is the wonderful texture that watercolour lends to a digital piece: it responds beautifully to dodging and burning. For the wash, I mix up burnt sienna and Prussian blue. As it's drying, I fleck water over the surface to create blossoms on the surface for the interesting patterns they create in the background.



7 Working in sepia

I'm not concerned with adding colours at this particular stage, because I'm effectively treating this watercolour as an underpainting. I'll add the final colours and effects later in Photoshop; for now, establishing the forms within the composition through value is the most important task.

I could add the colours in watercolour as well if I wanted to, but I want to play to the strengths of each medium for this portrait. Digital painting is great for bright, intense colours, but it can tend towards looking plastic, for reasons I'll touch on later. Watercolour, on the other hand, struggles with achieving bright colours but can generate beautiful textures as the water dries on the surface, and gives linework a wonderful variety.



6 Transferring the drawing

There are dozens of ways to transfer a drawing to paper: light tables, graphite transfer, Artograph, freehand and even methods of printing directly from a computer onto watercolour paper. Any of these methods are good, but I usually go with the ever-dependable Artograph. Whenever I'm transferring a drawing, I spend only as much time as is required to establish the basic shapes and outlines. Then I finish as much of it as possible freehand: drawings that rely too heavily on the transfer tend to lose their soul. After I've transferred the basic outlines to my watercolour, I begin working freehand. I first focus on refining the forms and doing a more accurate drawing.

PRO SECRETS

Layer flair

Keep your layers organised. Some layer types can be merged together without negatively affecting the image. Several Multiply or Screen layers can be merged. Try to keep your PSD file clean, so that if you find later that you need to add more shadows to an area, you can create a new Multiply layer, add your shadows and merge this into your existing Multiply layer. This will save you headaches later on.



8 Opaque highlights

Once I've established the shadows, I use a white watercolour or gouache to add opaque details and highlights. This opaque highlighting step could also be done on the computer, but I enjoy the feel of a natural brush a little more than a Wacom tablet's pen. (One day, when Wacom in its wisdom releases a digital brush with fibre-optic hairs that works like a traditional brush, I will happy to do this on my computer.)



Featured book: The Encyclopaedia of Mammals by David MacDonald

9 Scan and adjust

Now that I've arrived at a watercolour underpainting that I'm satisfied with, I'm ready to scan it. After it's scanned, I use a Curves layer to pull back some of the depth that was lost in the scan.

Next, I add a host of layers to get the image to look correct before moving on. The key issue is to make sure that no areas on the image at this point are absolute darks or absolute lights. I want the image to occupy a midtone range. To do this, I create a Lighten layer filled with a midtone ochre colour and set it to a lower opacity. This Lighten layer helps to scale back some dark pencil work that's too intense.

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10 Shadows

Once the image has been adjusted, I'm ready to begin laying in the shadows. I want them to be deep, with the sense of a classical Edwardian-era portrait. I want the scene and the image itself to feel as though it were lit by a candle, so I can make a natural focal point of our monster's face through lighting.

Often I work with dozens of layers to arrive at the final Multiply layer. I work using a textured, soft-edged brush or an airbrush, and I erase out areas that aren't to be affected. I then take down the layer's opacity until it looks correct, and begin again on a new layer. This process gets repeated dozens of times.

11 To colour a monster

There are many methods of applying colours. For this illustration, I'm going to use layers of Soft Light. I like working with Soft Light because it approximates the feel of colour glazing in oils, and I want to maintain the look of classical portraiture. I build slowly, using as many layers as necessary. Often I'll paint an area, take the layer's opacity down to 15 or 20 per cent, and repeat the process.



PRO SECRETS

Minor details

Don't worry about detailing every single bit of your illustration. While this level of detail may be impressive on its own, it doesn't always help the image overall. When you focus on all the minor details of an image you lose a sense of the whole; and if you try to focus on the whole of an image, you lose your sense of the details. A successful illustration must reconcile the two.

12 Stage lighting

Now it's time to make the monster glow. In many ways, this stage is the inverse of the Multiply/Shadow stage, and it's where the watercolour's texture really shows its worth.

Using Colour Dodge layers and a dark grey, I work in much the same way as I did on the Multiply layers, brushing in and erasing out on several different layers until the image looks right. Colour Dodge reacts wonderfully with watercolour, pulling up the contrast on the texture and the grain.

I use the effect sparingly, and only in areas to which I want to direct the viewer's attention. If you use this all over the image, the illustration will lack focus.



13 The hairy details

I now begin to work in my final hairy details. I paint using Screen and Normal layers. I work on the basis that shadows are to be painted transparently, and highlights are to be painted opaque. This helps maintain which areas are to be focal points, and which are to recede into the background. I try not to use too much Normal layering. If I work too opaque in Photoshop, the piece takes on the plastic look that's the bane of most digital art. Yet there are some details that absolutely need to be sharp and opaque: the highlights on metal or teeth, the rim of a horn, the areas around the eyes.

Along with using Normal to sharpen details in the eyes, I use it in subtle glazes to diminish areas where the texture is too obvious. In the background, I've laid in a thin layer of darks.



WORKSHOP BRUSHES

PHOTOSHOP

CUSTOM BRUSH: MONSTERBRUSH NO.1
BRUSH TIP SHAPE
Diameter: 100%
Roundness: 100%
Spacing: 49%
SHAPE DYNAMICS
Angle Jitter: 38%
Control: Direction
COLOUR DYNAMICS
Foreground/Background Jitter: 3%
OTHER DYNAMICS
Opacity Jitter: Pen Pressure
Flow Jitter: Pen Pressure

I use this brush for shading and blending. Its texture allows for the blending powers of the airbrush, but without the synthetic look that so often accompanies it.

14 Colour balancing

At the end, I colour-balance the image. I try not to use too many colour-balancing effects: if they are used too much, they burn out an image, scorching the texture and exaggerating the highlights. This too is a bane of digital painting, and one to be careful of. I use it very sparingly at this stage of a painting. Here I've used it to pull the painting into a slightly warmer and darker range, and I've turned the opacity on the layer down to 50 per cent.

Now we're finished. It's time to take the image to the printer, and hope that the client doesn't eat me.



TOP Ten

FANTASY ART POSES

Whether you're drawing a hero or a villain, we've got the gestures and silhouettes to help you out...

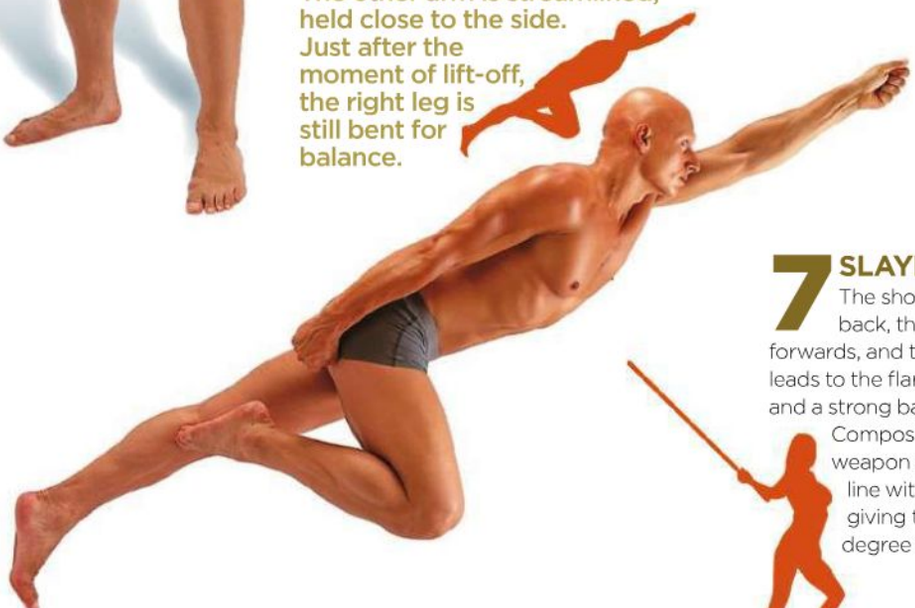


10 VILLAIN MAKING PLANS

With sloping shoulders and the head angled slightly down, this pose is closed and still – full of calculating malice. One fist grasps the other, causing the muscles of the arms to bulge, and the feet are planted firmly on the ground.



With the arm muscles tensed, this pose hints at power that's yet to be unleashed.



8 FLYING

The leading arm is outstretched, indicating powerful momentum. The other arm is streamlined, held close to the side. Just after the moment of lift-off, the right leg is still bent for balance.



The staff is held ready, giving a sense of impending action.

The face is lifted slightly and looks in the direction of the leading leg.

The leg is straight and powerful, planted firmly on the ground and defining the direction of the character's gaze.

The arm is straight and at a right angle to the line of the eyes, adding stability and strength to the composition.

The stomach muscles are relaxed but slightly twisted to the side.

9 WARRIOR

This is a beautifully balanced and elegant pose. The extended leg is long and straight, and is at a right angle to the staff, giving the character added balance and strength. The right arm balances the body as it leans forwards, while the slope of the shoulders creates a diagonal almost parallel with the line of the leg. The staff is gripped with a strong hand, giving the pose a focal point.

7 SLAYER

The shoulders are thrust back, the chest pushes forwards, and the slim waist leads to the flare of the hips and a strong balanced stance. Compositionally, the weapon creates a clean line with the back leg, giving the pose a degree of equilibrium.

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Top ten fantasy poses



6 PREPARING TO STRIKE

The extended arms stretch the chest and stomach, and the muscles are clearly defined as a result. The raised leg counterbalances the sword held behind the body. It follows that as the sword falls, the leg will drop down and back in response, feeding more power into the attacking action.

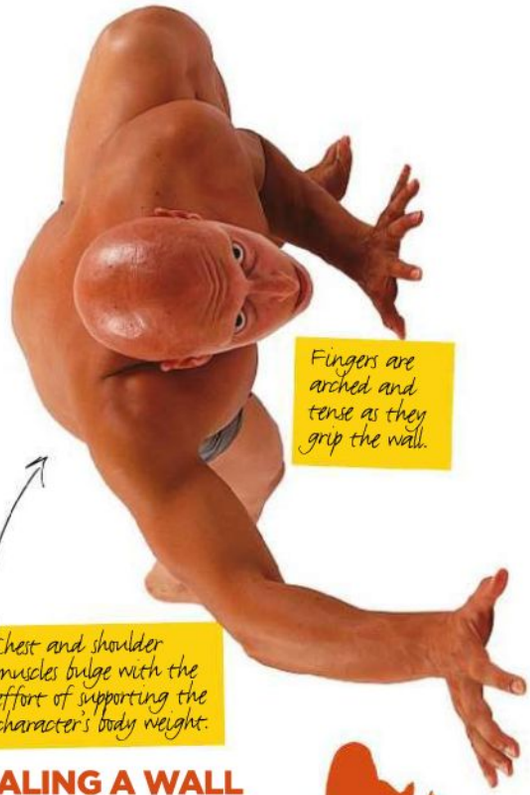






5 EVIL SORCERESS

The arms are raised in twin claws of menace and evil intent, while the face is impassive and coolly confident. This pose suggests an imminent strike.



Fingers are arched and tense as they grip the wall.

Chest and shoulder muscles bulge with the effort of supporting the character's body weight.

3 SCALING A WALL

Viewed from above, we see the gripping hands and arm muscles taut with the strain of clinging to the wall. The raised left leg balances the leading right arm. The upturned face and concentrated stare hint at a sense of purpose and also help create the illusion of height, as the character looks to his destination.





4 WALKER IN THE WOODS

Both the left arm and the left leg extend forward to suggest stillness (motion is represented by simultaneous movement of opposing arms and legs), creating a diagonal hip line and strong leg shape. The right arm pulls back, causing the shoulders to pull together.



The face is intent and focused, locking a steely gaze upon the victim.



2 VILLAIN CREEPING

Keeping low, the torso is held parallel to the ground. The arms are ready to lurch forwards and grasp the prey.



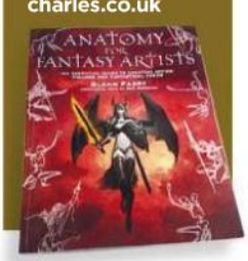


1 VICTORY

Successful in battle once again, the mighty hero raises his muscled arms and shouts his victory to the heavens. The straight limbs create a X-shaped silhouette that adds dynamism.

Fantasy anatomy

These poses come from the book Anatomy for Fantasy Artists by Glenn Fabry. **www.davidandcharles.co.uk**



Artist insight

STRIKE A POSE

Warren Louw explains how to fill your characters with energy and dynamism by learning the art of posing...

Artist PROFILE

Warren Louw
COUNTRY: South Africa



Warren is a professional illustrator who spends his spare time reverse-engineering feminine beauty.
warrenlouw.deviantart.com

On the disc

Find sketches by Warren in the Strike A Pose folder inside Digital Art Skills

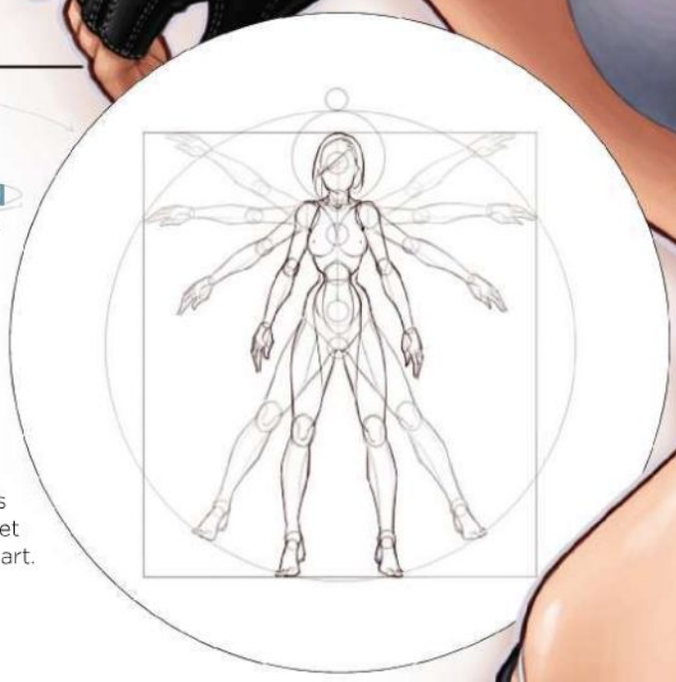
What I'm about to tell you are the crucial basics, the foundations of your characters. If you're not getting this right, don't expect too much else to get better. Posing greatly extends and energises the personality of your character, giving you the control you need to deepen the relationship that they have with the viewers. This is where you give your characters life. This is where it begins.

Be very specific about what you want and what you like. Study it, understand it, make it a part of you and expand with it. Nothing is random. Everything has a purpose. Aim high. Aim beyond what's ever been achieved in art. Learn from other artists around you. Art is about self-expression and reaching new undiscovered levels within yourself.

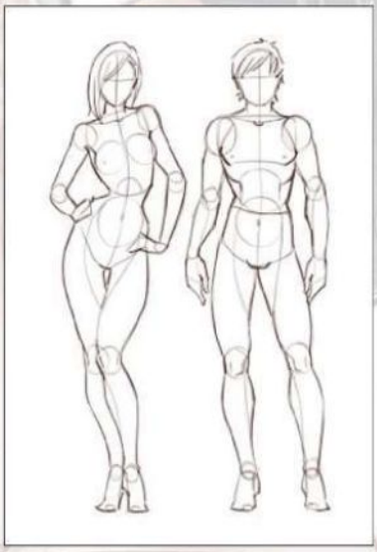
Find your own style. We are all unique expressions of infinite possibilities, so we all have the potential. Make sure that you're loving the experience that art is bringing to your life, and you will only move forward. When you have all the ingredients in place, you can think about your characters in terms of their spatial relationship to the world.

1 STATE YOUR INTENTION

Before you even pick up a pencil, the most important thing to consider is intention – visualising and knowing what you want to achieve. You have to be very specific about what you want, you have to believe you can do it, and you must expect it to manifest. Aim the highest you possibly can, higher than anything that's ever been achieved in the history of mankind on Planet Earth. This way you charge the process with positivity, and you'll be sure to get things off to a great start.

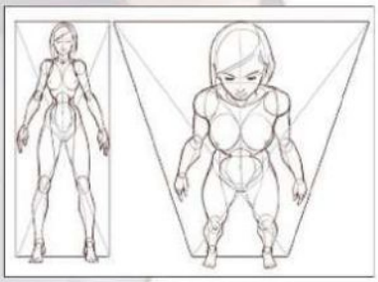


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2 MALE VS FEMALE

If you can master the feminine, the masculine will be pretty easy. They share many of the same basic characteristics. When dealing with the male, it's just a matter of adjusting a few things here and there. I don't draw males much, but I can do it very effectively because of my work with the female figure. Those who focus primarily on males will have a far greater difficulty achieving feminine beauty and sexiness.

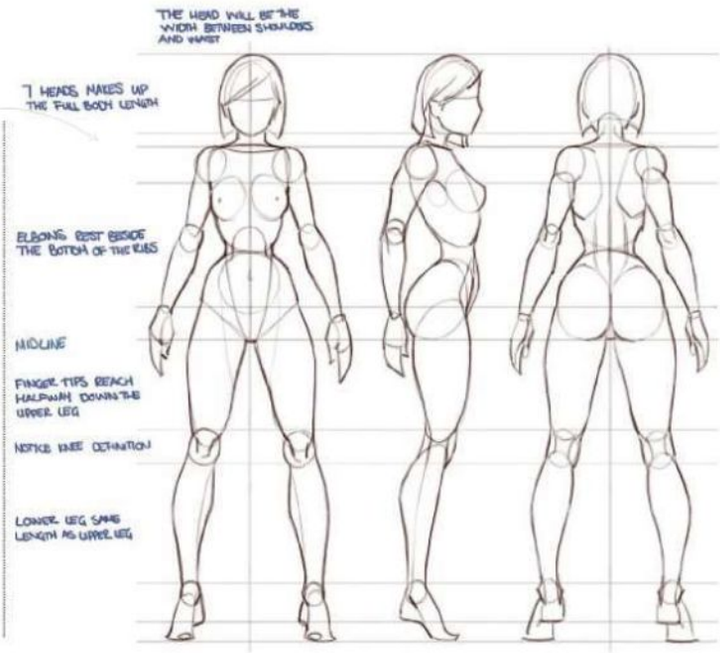


3 LET'S RECTANGLE

Foreshortening and perspective can be quite the cow for all of us artists – don't think the pros are excluded from this difficulty. So here's a good starting point. If you know how to give perspective to a box, or even a rectangle, this should help you give perspective to your figures, since both have a front, sides and a back. Yes, the human form is far more complex than that, with many other things to consider. But if you can keep the proportions within the rectangle guidelines, things will come much easier. Notice the consistency of the centre point throughout both boxes.

4 UNDERSTANDING EXACTLY WHAT YOU'RE DEALING WITH

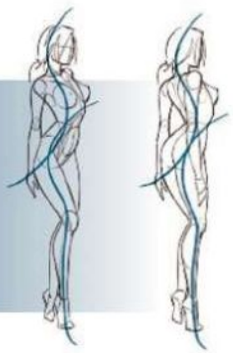
What needs to happen early on is for you to become familiar with the shapes and forms that you'll be working with. You'll need to pay attention to all the curves, joints and body parts, and understand where they need to be in relation to each other. Finding the hidden lines and patterns where certain points meet and join will be your guide to work from. Just remember: every tiny line you draw has a purpose and is designed to work as one with the rest. You'll notice that if one thing is out, then others will follow.

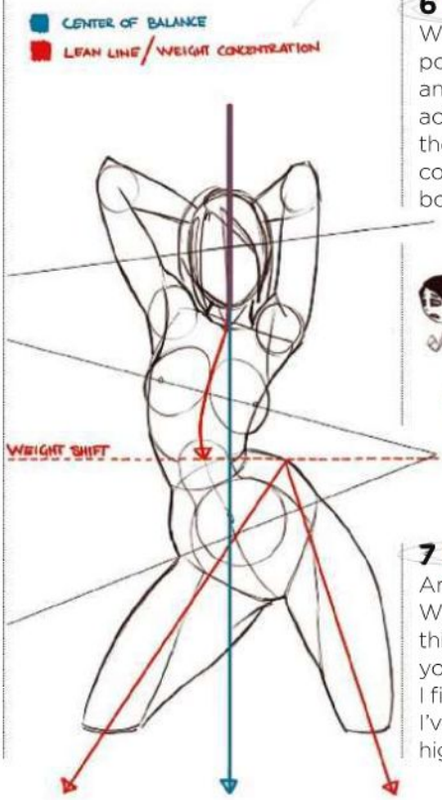


"I find my skills spontaneously upgrade themselves after I've worked with a range of alternate styles..."

5 FLOW

Everything has a flow. With a bit of attention to anatomy and its rhythm, this will soon become clear. The best way to help your poses have flow is to think of an S shape, as this will be the flow leading your eye through the pose, and will even help with your overall composition.





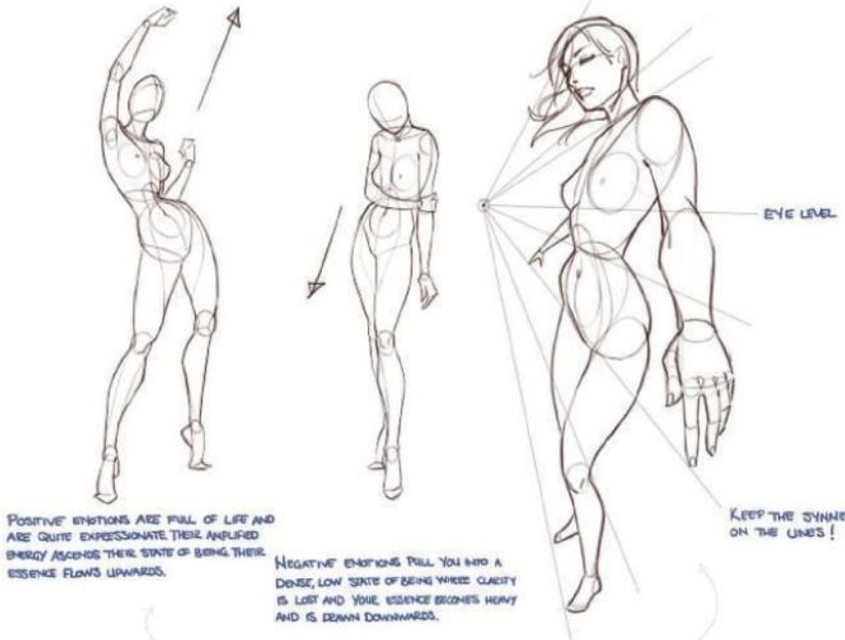
6 THE ANGLE EFFECT

When giving your figure an attractive, confident and sexy pose, you have to adjust the angles of the head, torso, hips and legs. To draw it, you need to understand it. This pose is achieved by the legs shifting, pushing the channelling of the body's weight to the right side. Now the right hip is confidently exposing itself, and with the legs wider apart, both legs are taking a good portion of her weight.



7 EXPERIMENT WITH A DIFFERENT STYLE

Amazingly, you can learn a lot from using a different style. Working from a different perspective on how to approach things can give you a fresh viewpoint. It will only expand your understanding about posing and anatomy in general. I find my skills spontaneously upgrade themselves after I've been working with a range of alternate styles, so this is highly recommended to all.

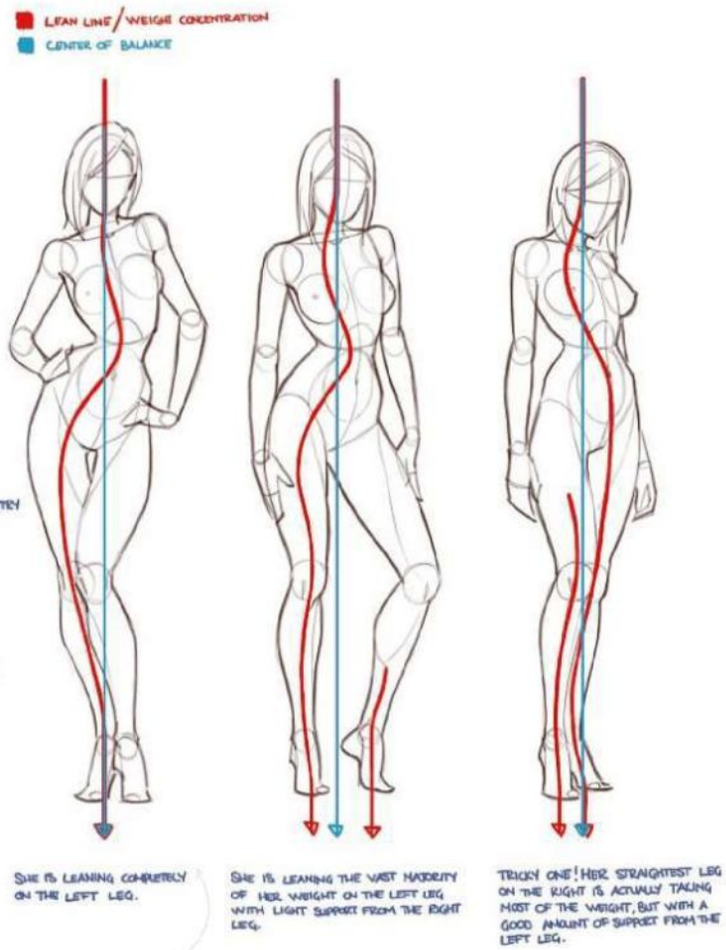


8 ADD EMOTION

Emotion and mood are vital elements when creating a piece of artwork. A pose in itself can convey many emotions without using things like facial expressions. Real emotion is always expressed throughout the rest of your body as well. There are no exceptions: it just depends on intensity. So just be aware of body language.

9 VISUALISE A VANISHING POINT

You first need to establish the eye level: you'll be looking up at everything above it. Try to keep the symmetry of the body running on the lines. Refer back to the figure's front design to see which areas and elements run parallel with each other.

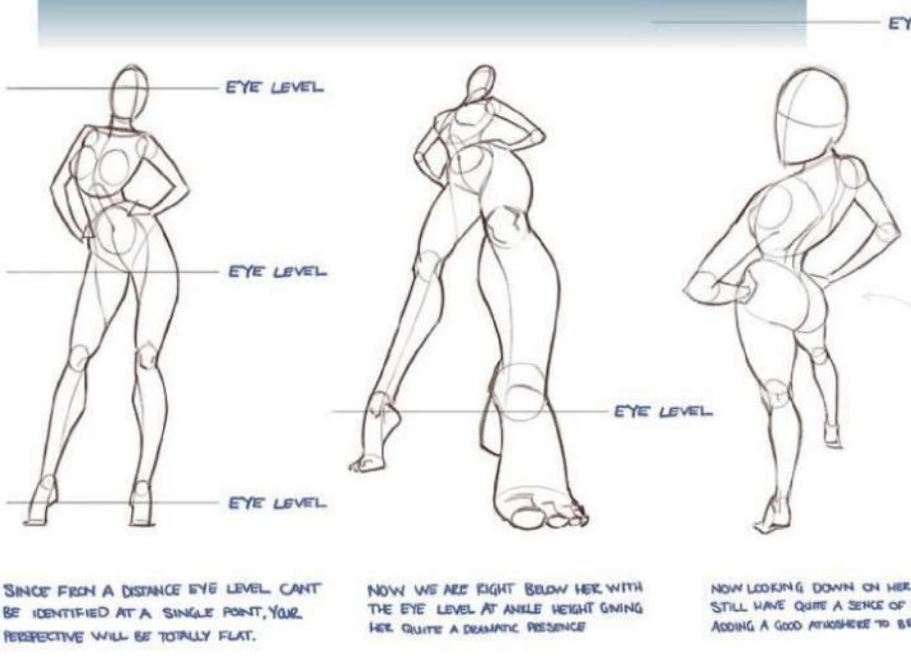


10 THE FOCUS YOU NEED

Breaking it down to a simpler scale will give you the focus you need to concentrate on the essentials without all the details confusing you. Loosen up your technique and just flow with it. When you think too much, you're acknowledging that you don't already know it all. You know more than you think, so don't let thought obstruct you.

11 BALANCING THAT WEIGHT

I'm sure you have been left frustrated sometimes – all you're trying to do is get a simple pose, right? This is normally a result of being oblivious to the physics of balancing and centring weight. The solution is pretty basic: the leg that's the most upright and straightest is the one that takes most of the weight. So keep your footing balanced in relation to your character's centre, also keeping in mind where the focus of the weight lies.



12 SILHOUETTING

A great way to check if your pose is eye-catching or dynamic is to fill it in with black or a darker colour and reduce it to a silhouette. This enables you to see if your pose has flow and impact, and still conveys the same essence that you originally intended. Your focus is being centred on the actual form, with no internal affairs to distract you.



13 LEVEL OF THE EYE

Eye level is really important in creating a dynamic pose. Using a low view can make a character seem dominant, heroic or just plain huge. The point from which you view it plays a critical role in creating a pose, because this is essentially how you want the world to see it. So when deciding on a pose, consider where you want the eye level to be, as this can make even a simple pose appear very dramatic.

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Artist Q&A

Learn from the professionals as our panel of experts tackle real-world anatomy issues

Our panel

Marek Okon



Marek is an experienced sci-fi and fantasy artist, though he started out as a web designer. He has worked as a digital illustrator for two years.

omen2501.deviantart.com

Jonny Duddle



Jonny is a freelance illustrator. He's working on a top-secret project for Aardman, and released the picture book The Pirate Cruncher last year.

www.duddlebug.com

Andy Park



Andy is a talented concept artist who works for Sony. Among the games he has worked on is the popular God of War for PlayStation 2.

www.andyparkart.com

Bobby Chiu



Bobby Chiu is an independent artist from Toronto, Canada. Part of the Imaginism outfit, he's involved primarily in film and TV production.

www.imaginismstudios.com

Jim Pavelec



Jim Pavelec lives in a world surrounded by demons, monsters and devils. He's the author of the how-to monster book Hell Beasts.

www.jimpavelec.com

Frazer Irving



Top comic artist Frazer spends lots of time drawing horrid-looking things on his Wacom Cintiq. He's worked for 2000 AD and DC Comics.

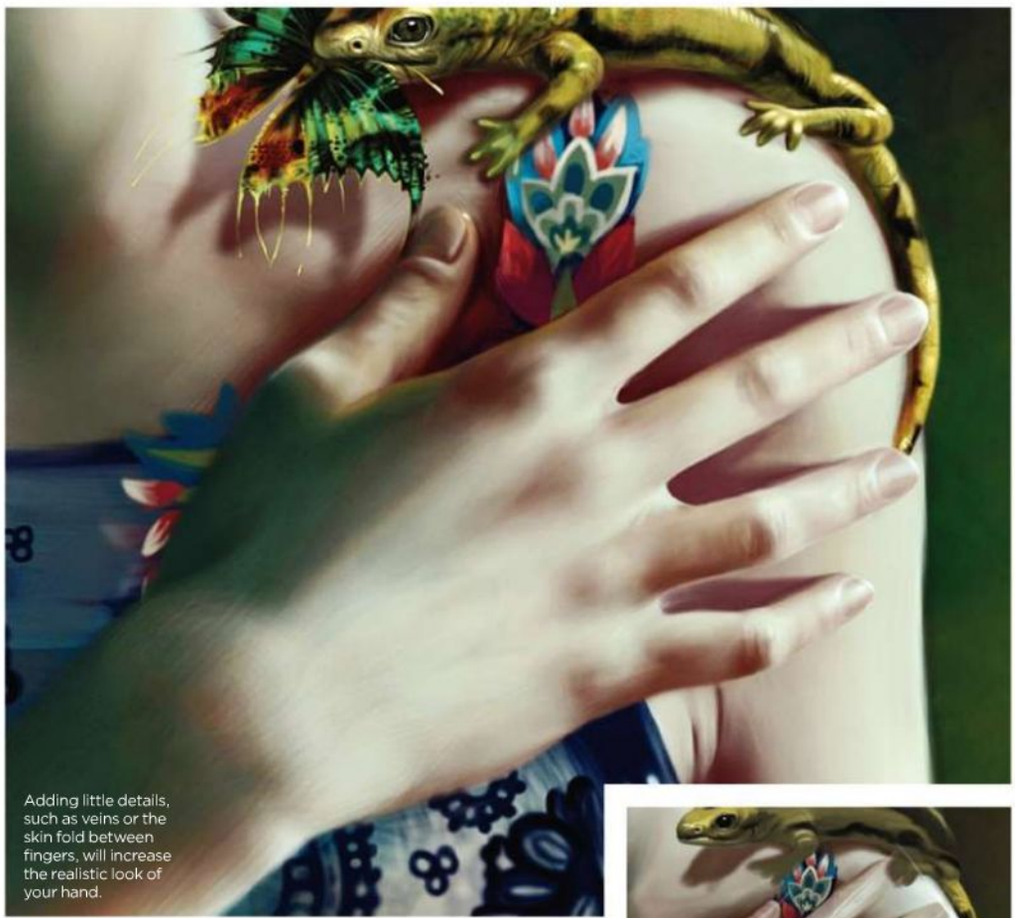
www.frazerirving.com

Melanie Delon



Melanie is a freelance illustrator who specialises in fantasy portraits. Her most recent book cover is for the ebook of A Crown of Swords.

www.melaniedelon.com



Adding little details, such as veins or the skin fold between fingers, will increase the realistic look of your hand.

Question

How can I make the hands I paint appear more realistic?

Answer

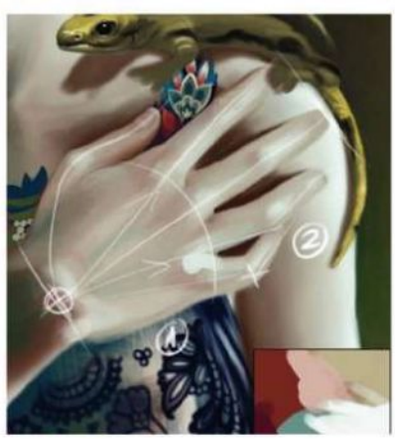
Melanie replies



Hands are one of the most difficult parts of a character to paint. You should bear in mind that they have soft, round edges, and also that they are a powerful way of conveying emotions.

When you begin a hand, think about the construction lines (they all come from the wrist): don't hesitate to use your own hands as a model. In general, fingers are halfway along the hand, and they are more like cylinders than boxes.

When you're satisfied with your sketch, start shading. Try to smooth as best as you can here. Use a basic Hard Round brush



The colour scheme for a hand is the same as for the character, except for the extremities of the fingers and the joints, which are redder.

tip for the base and a speckled one for the final blending. The light is stronger and redder at the joints, because the skin is thinner there.

The next step is texturing. This stage is the most decisive one. I use a basic Hard Round tip with Hardness set to 70% and Shape Dynamics set Size Jitter Control set to Pen Pressure. I add a few thin lines and folds on the skin, and some light dots on another layer.

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Question
What's the best way to draw a screaming face?



Answer
Frazer replies



All the way from Edvard Munch to Jack Kirby, every artist has their own way of depicting screams. The type of scream can vary a great deal depending on the emotion that drives this reaction: as an artist, you need to know the differences between a scream of fear as opposed to a scream of anger, or perhaps of pain. It's not uncommon for a lazy artist to use the wrong expression for an illustration and cause much confusion in the onlooker, especially in comics.

What I'll do here is take you through the process of how I construct an angry scream for a comic, which is all about the scream and the power behind it.

To do this, I employ standard drawing techniques next to graphic elements, in much the same way that Munch used swirls to enhance his Scream painting. Remember, though, that even the most detailed-looking image is really still composed of the most basic elements. The trick is to identify which aspects of the face convey the idea most effectively.





Artist's secret

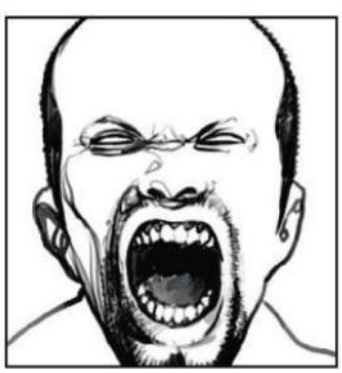
FLIP CHECK IN PHOTOSHOP

Every artist leans to one side. Use Edit > Transform > Flip Horizontal to flip your drawing and check that the lean isn't too extreme. A little's fine, but you can spot major errors this way.

Step-by-step: The perfect scream



1 I start with a rather basic sketch. This drawing is loose and rough, to effectively capture and reflect the raw energy that's needed to drive the rest of the art. I always find that the initial stage of a drawing – whatever the tone, style or subject matter – provides the fuel for the final image. You mustn't hold back at all at this point if you want to capture that scream.



2 Next, I trace over the sketch on a new layer. These lines refine the basic shape and the main features, framing the mouth with a beard and making sure that it reads as simply as possible. A lot of the raw energy from the original sketch is lost at this stage, because of the simplicity of the black line – but this will all return as I progress to the final piece.



3 The next stage in the process is to block in some shadows on the subject's face. Extreme, dramatic lighting can be an incredibly valuable tool when you're trying to create a particular mood, and is especially useful when defining dramatic lines on the face. Here, I choose to use quite strong side lighting, to imply the conflict of emotion within the character.



4 The wrinkles stemming out from the eyes are very important in depicting strong expressions. Here I exaggerate the lines on the forehead a little to enhance the anguish, as well as darkening the bridge of the nose to show tension. These features capture the basics of the scream: after this, all you need is the right colour palette and a well-chosen background to set it off perfectly.



In this painting, I use various tricks to suggest movement, such as adjusting shadows to place vehicles in mid-air, rough brush marks and flowing fur and flags.

Question
My figures always look static in my paintings. How can I give them more of a sense of motion and dynamism?

Answer
Jonny replies



It's common to find that the more you work on an image, the more static the end result becomes. I often find myself rendering a successful character sketch, with lots of movement and dynamism, into something dull and lifeless. But there are ways of keeping a character looking dynamic.

The most obvious place to start is the character's pose. To properly convey character, you need to paint figures in poses that suggest their personality and movement. For example, an aggressive character could be hunched over with clenched fists and taut neck muscles.

Sketch the figure, then revise it with a more exaggerated pose. Keep pushing a pose: it will often gain more and more personality. Use layout paper to trace parts of the previous drawing, or sketch digitally and save different versions. You can use Photoshop's Transform tools to stretch, scale and distort particular parts of a figure's anatomy.

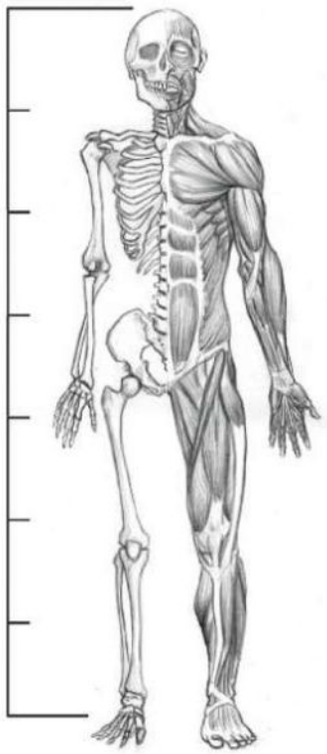
Reference is important. Look at photographs of figures in motion. Analysing some of the incredible photography online or in magazines, can reap benefits when drawing dynamic figures. Skateboarding shots are a good example: they do a great job of showing the human figure in movement and under lots of tension and stress.

Lastly, look at artists and art reference books for tips, tricks and techniques. There are some wonderful artists, such as Phil Hale and Jon Foster, who are masters of dynamic figure painting. Look closely at how they use composition, perspective, figure drawing and mark-making to add dynamism to images.



Sketch your character, then revise him with a more exaggerated pose. Real-life action shots of skateboarders are a good source for seeing the human figure in movement and under tension.

Question
What does the term 'heroic proportions' mean in the context of character design?



This image shows the proportions of the average human male, and the musculature and skeletal structure beneath the skin.



Now take a look at our hero. At between eight and nine heads high and a shoulder span of about four heads, he's the guy you want on your side.

Answer
Jim replies



Heroic proportions are important when working in comic books or fantasy illustration. A common unit of measure when drawing the human body is head height and width. At eye level, the typical human being is roughly six-and-a-half to seven heads tall, and three heads across at the shoulders – the body's widest point. But you don't want your superhero looking average, so design them based on the principle of heroic proportions.

A hero should stand anywhere between eight and nine heads high, with a shoulder width of four heads across. The hero's waist is kept the same as the average person's, to help accentuate the width of their shoulders and the sweep of their crushing thighs.

Question
I've learned how to paint an eye head-on, but there seem to be no workshops on how to paint one from the side. I've tried and failed. What could I be doing wrong?

Answer
Andy replies



The key to drawing or painting an eye is to think of it in three dimensions. Although we instinctively think of eyes as almond-shaped, they're of course spherical, with only about a quarter of the sphere visible. The eyeball is basically a sphere with lids that wrap around it. Keeping these things in mind will help you when you have to illustrate the eye from different angles – even from a direct front-on view.

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Question
How do I put realistic mass and weight into my character designs?

Answer
Bobby replies



'Weight' is really gravity acting upon a mass. Therefore, the best 'weighted' character designs accurately reflect how gravity affects a body. Looking around you, you can gauge this in a couple of different ways: by looking at the body, and by looking at how the body affects the environment.

In a soft mass such as a pot belly, where gravity is strong and the forces holding up the fat are weak, the greater the weight is, the lower the soft tissue will droop or hang down.

Also, consider how weight might impact your subject's surroundings. If your character is heavy, they might sink into the mud or cause the bridge or branch that they're standing on to bend noticeably. If they're being lifted (strenuously) off the ground, the vertical forces associated with the action should be tense and taut, to demonstrate how difficult it is to overcome the gravitational forces trying to pull the body back to earth.

In a magical environment, you could guide expectations by making your heavy character appear to be made of stone or something else that's very dense. Your viewer will understand from association that stone is heavy, therefore your character must be very heavy as well.



The initial sketch to capture the idea and establish forces. The monk is straining to lift the monster, but the monster does not budge.



In this later version of the same image, the weight of the monster is shown by the monk's reaction: there's strain on his face, and his back and legs are stretched with tension.

Artist's secret

BALANCE

In the image below, the monk's centre of gravity is behind him. If he wasn't trying to lift the monster, he would fall over: the further back the monk leans, the more weight must be in front of him to counterbalance him. Therefore, the degree of lean in his body also indicates how heavy the monster is.

Step-by-step: Painting eyeballs side-on

1 Here's a quick sketch of someone's right eye. As you can see, there is a circle faintly drawn in, which represents the sphere that makes up the eyeball. There are two lids that wrap around the eyeball and, in doing so, cover the majority of it. Take note of the way in which the bottom lid wraps under the top lid on the side.



2 This is the same eye, seen from the side instead of the front. I've rendered out the sphere that makes up the eyeball within the eyelids to help to illustrate the three-dimensionality of the form. Again, note how the top lid goes above the bottom lid on the side. It's really important to get the eyes right, or else the picture can distort.



3 Here's the final rendering of the eye. There are a few things that are worth noting here. Because the eye is moist, you need to capture its reflective nature; there's a shadow that the top lid creates on the eyeball; and the whites of the eyes are not solely white – they too need to show elements of form and shadow.



Question
How do I draw facial expressions that convey the right emotion and don't feel stiff or forced?

Answer
Jonny replies



If you're painting figures, drawing cartoons or rendering 3D characters, you need to make them interesting to look at. Whether it's evil, sad, happy or deadpan, their facial expression could be vital in communicating the story or message in your work.

However different people may look, everyone's faces are made up of the same set of bones and muscles. By becoming familiar with the basic anatomy of the face, it can be easier to paint more believable expressions. You don't need to name every muscle or identify every component of the skull, but with practice, you can get to know the main building blocks of the face and how they fit together.

Use reference to practise drawing faces. Reference can be anything from photographs you've taken or in books and magazines, DVD stills or old-master paintings. While drawing, try to identify the main shapes in the face and how they distort and move with different facial expressions. Also try exaggerating the size of particular features to see how subtle modifications can affect the mood. Try big noses, heavy brows or high foreheads. Small changes can make a big difference.

It's also worth bearing in mind that facial expressions work in conjunction with body language, so in most cases you'll need to ensure the face matches the body.



It's a good exercise to draw different facial expressions, whether you try drawing the same character or a variety of different faces from reference.

Artist's secret

USE A MIRROR!

This may sound obvious, or even a little embarrassing, but keeping a mirror on your desk can be a great help in painting believable expressions. Take some time out to sketch yourself so you get familiar with the movement of facial muscles while pulling faces, and use these sketches to inform your work.



Don't be shy: draw yourself! (If I look a little wonky, that's because I am...)

Question
I have trouble posing figures realistically, particularly when they're in mid-action. How can I make my moving figures better?

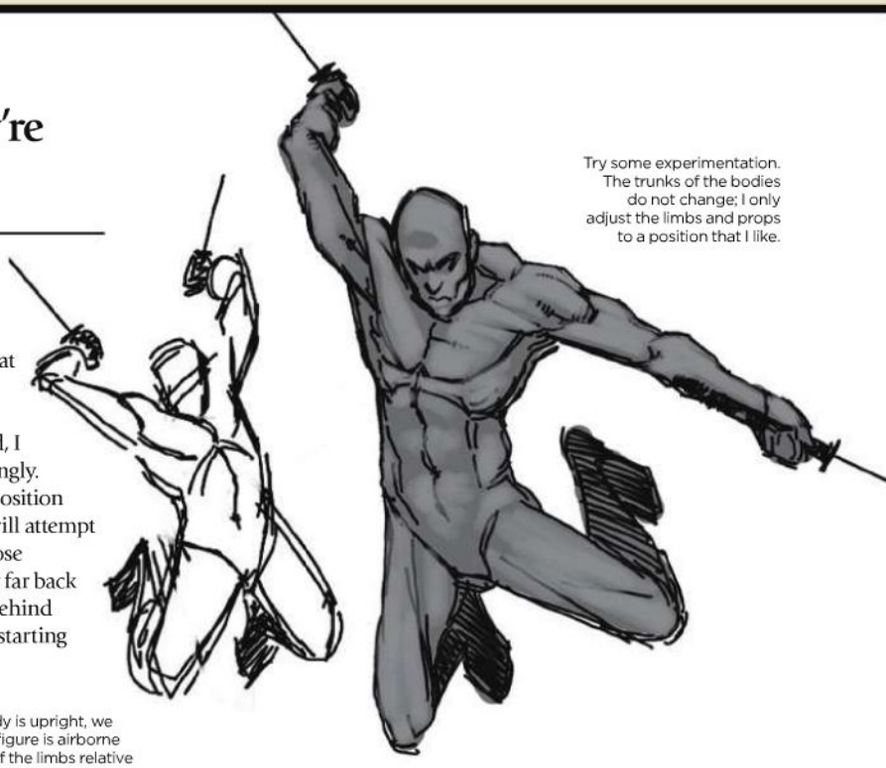
Answer
Bobby replies



When you show bodies in motion, you must consider physics. What are the effects of gravity on the pose? What about inertia or momentum? Which way is the body moving? All of these considerations tell you which forces are acting on our figure, and how much strain the body should undergo to do what it wants to do.

Next, consider the restrictions imposed by anatomy. Bodies are limited in the ways that they can bend, twist, stretch and rotate. Artistically speaking, it's acceptable for you to exaggerate these limits, but not to ignore them altogether. Take a leaping figure: when a body is airborne, gravity pulls it down, led by the trunk of the figure. Inertia dictates that the limbs will tend to trail behind the torso.

With these points in mind, I sketch out my figure accordingly. If I'm unsure about how to position certain parts of the body, I will attempt to recreate that part of the pose myself, so that I can see how far back an arm or a leg can extend behind the moving body without it starting to feel uncomfortable.

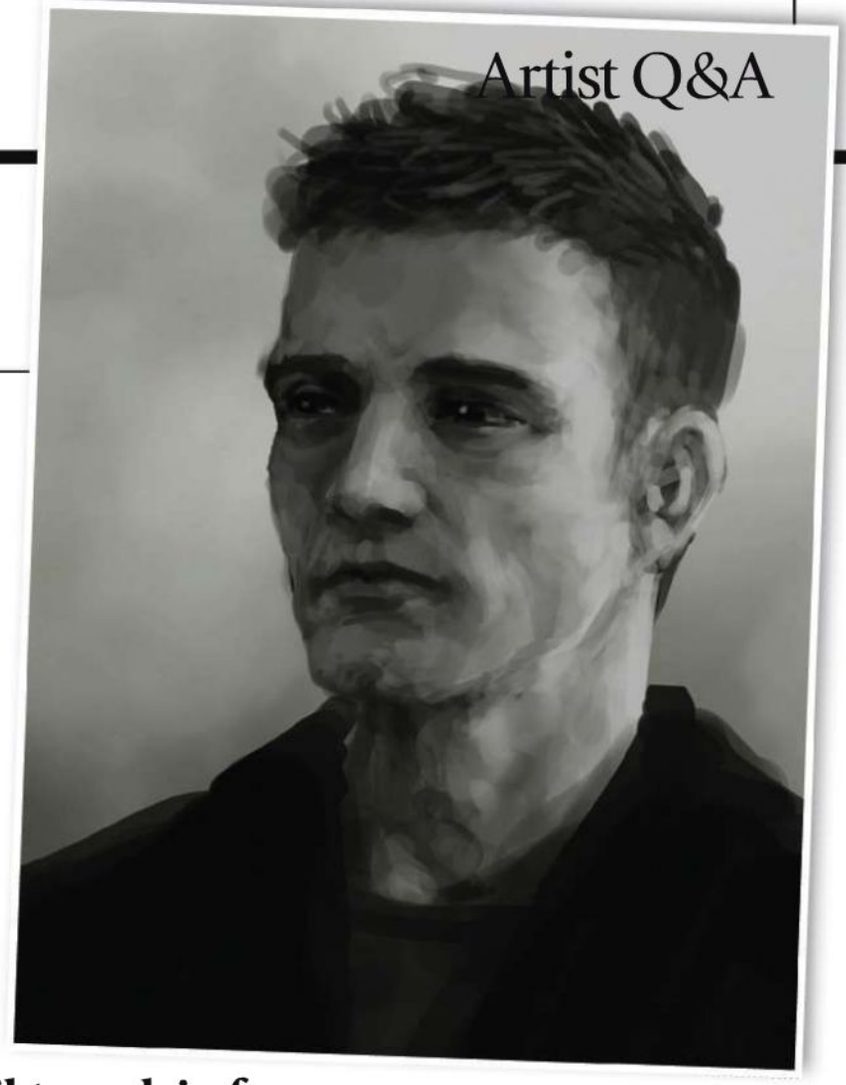


Try some experimentation. The trunks of the bodies do not change; I only adjust the limbs and props to a position that I like.

Even though this body is upright, we understand that the figure is airborne through the posing of the limbs relative to the body.

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Question
How can I be more true to life when I paint the shading on my character's faces?



Contrary to initial impression, the human face is an exceedingly complex object, especially when it comes to an accurate portrayal of natural lighting and shadow.

Answer



Marek replies

When I was younger, I always wondered why artists practised light and shadows on such simple objects as spheres, cylinders or boxes instead of on cool robots. Now I know that the simplicity of those objects enable an artist to fully understand how light casts shadow and then to transform this knowledge to more complex shapes.

Let's take the head, for example. It's a complex object with different planes to consider, which can be really tricky to shade properly. But if you break it down into basic shapes like spheres and cubes, it's much easier to grasp it in your mind.

In much the same way, divide complex scenes or objects into familiar shapes, and detail them after basic shading is properly done. This will help you greatly in your efforts to master the art of shading.

Step-by-step: Add shading detail to a plain face



1 Start with a basic shape – ideally a roundish cylinder (the head), attached to another cylinder (the neck) attached to another roundish cylinder (the body). Just to make this easier to understand, let's put a simple grid on our shapes and add some basic shading.



2 Now it's time for the basic features. The nose is basically a triangle sticking out in the middle of the face, while the eye sockets are those two symmetrical depressions. I usually paint these with a simple single brush stroke.



3 Let's shape this face more correctly. Here, I've split the surface of my head into shapes that can be shaded more carefully. All of those features are parts of spheres and cylinders that are fairly easy to shade. Just check out the eye area: it looks like I put another sphere into the middle of my eye socket.



4 The next phase is to blend the borders between these shapes, then add some muscle and skin structure to make the face fuller. Don't forget to stick to the shading you did before; it's a good base for complex detailing. Finally, you add in all the details you need. With good base shading, this head should look pretty convincing by now.

In every issue of ImagineFX, our panel solve real-world creative problems with helpful techniques. Email your question to **help@imaginefx.com** or write to **Artist Q&A, ImagineFX, 30 Monmouth St, Bath, BA1 2BW, UK.**

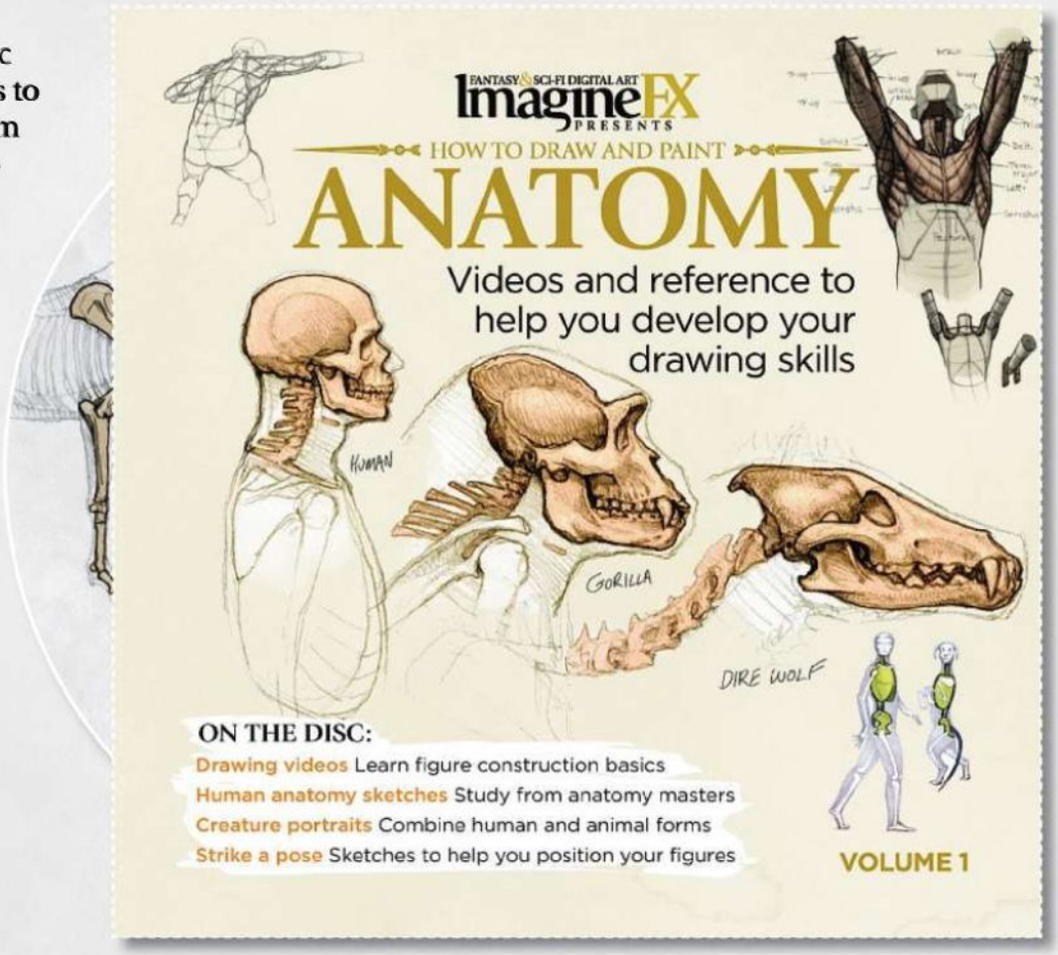
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To support our anatomy and painting workshops, your disc includes a wealth of resources to aid your creative process. From how-to videos to step-by-step workshop images, you'll find this disc essential.

Drawing videos
Learn the fundamentals of human figure construction with Ron Lemen

Step-by-step images
Follow the artists' steps to creating their paintings in our art workshops

Reference sketches
Study the drawings from our anatomy workshops in detail as you learn



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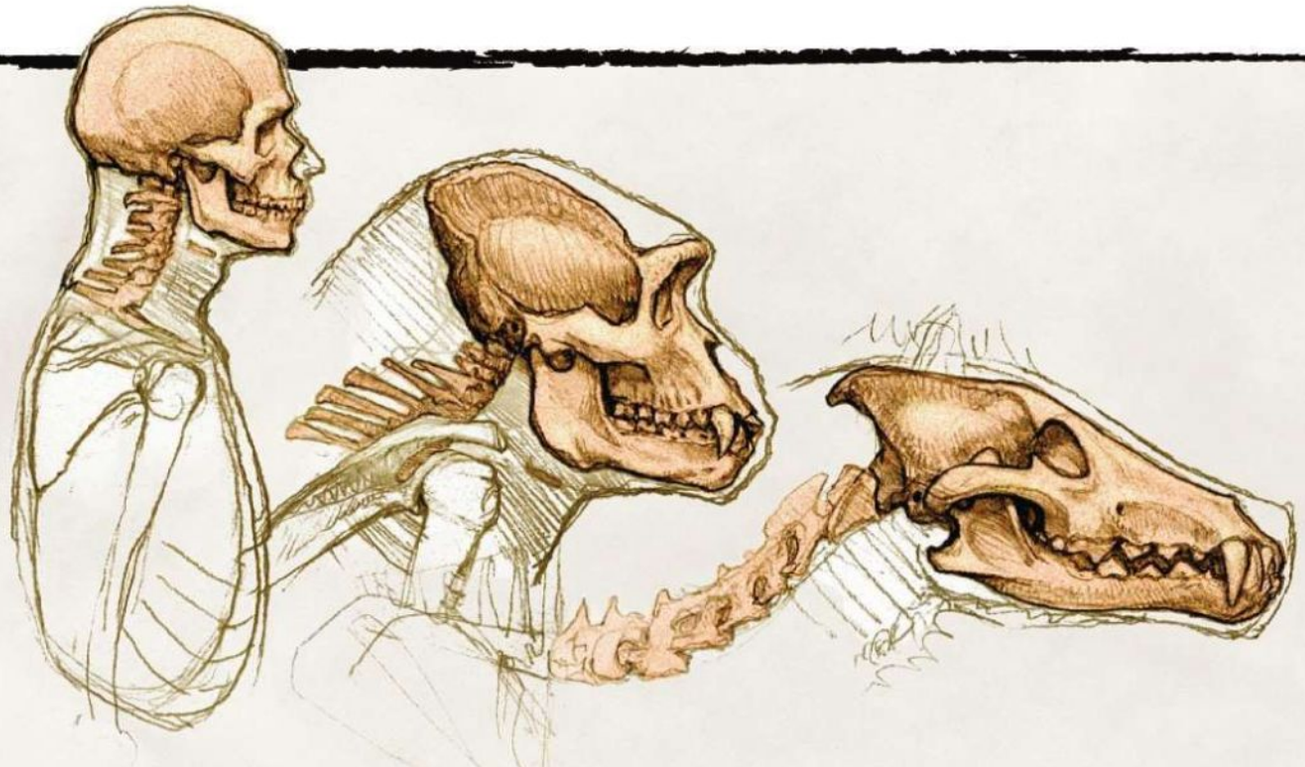






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