



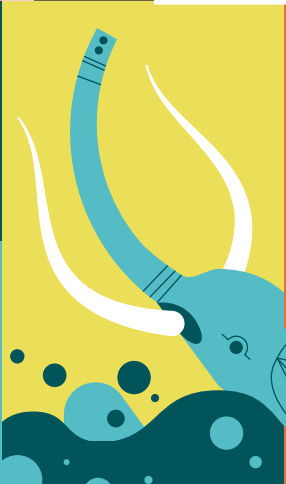
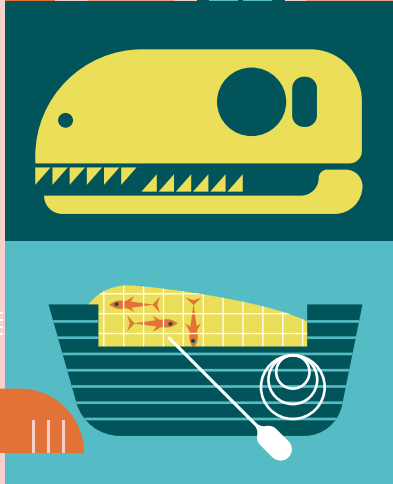
TAKE A WALK ON THE URBAN WILD SIDE

Scientific Illustration

GRADES 6 – 12

NATURAL HISTORY MUSEUM
LOS ANGELES COUNTY

LA BREA TAR PITS & MUSEUM



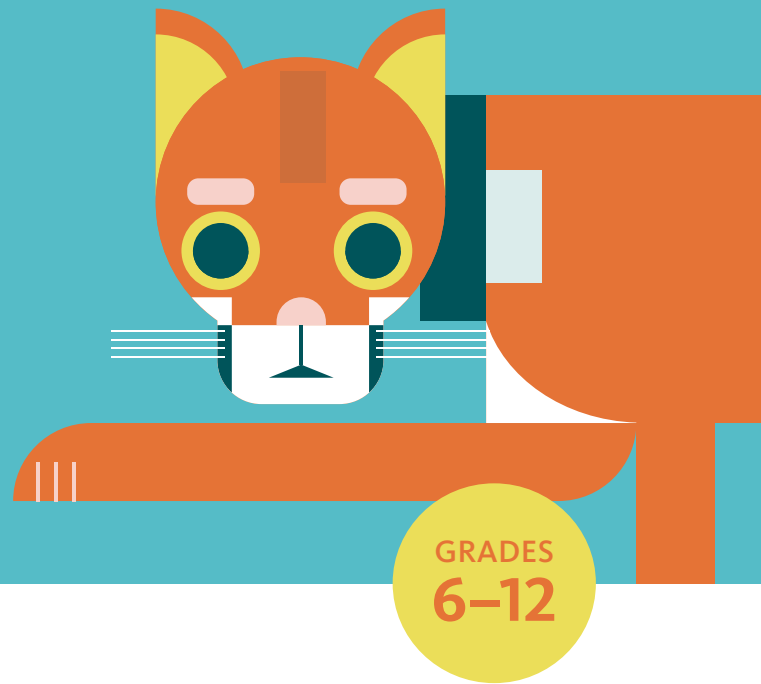
NAME:



**Cover and spot illustrations
by Patrick Hruby**

TAKE A WALK ON THE URBAN WILD SIDE

Scientific Illustration



GRADES
6–12

INTRODUCTION

Meet P-22, one of L.A.'s resident mountain lions! In this museum guide, we'll follow the story of P-22, a mountain lion who found his way from the western Santa Monica Mountains to Griffith Park in Los Angeles, California. Along the way, we'll better understand urban carnivores, or meat-eating animals that live in cities, and the physical features, or anatomy, of mountain lions that help them survive in their environment. We'll utilize camera trap images of P-22 and practice nature journaling and scientific illustration to draw an accurate portrait of P-22. We'll even learn how to draw headshots of P-22 and one of his distant relatives, Shadow the house cat!

MATERIALS

- Drawing or writing utensils
- Markers
- Colored pencils
- Pastels
- Watercolors

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THE STORY OF
P-22

LA'S MOST FAMOUS FELINE



(© Gina Cholick)

A mountain lion named P-22 lives in the heart of Los Angeles. In 2012, biologist Miguel Ordeñana was using camera traps (motion-activated cameras) to study whether wide ranging animals were isolated from neighboring open spaces by freeways and major roads. Miguel made a shocking discovery while reviewing camera trap images: a mountain lion, later named P-22, was living in Griffith Park!

After his discovery, P-22 was given a GPS tracking collar so scientists could continue to study him. "P" stands for puma, and "22" indicates that he was the 22nd mountain lion studied by the National Park Service in the L.A. region. P-22 crossed two major freeways to get from the western Santa Monica Mountains to the eastern end of the mountains into Griffith Park, where he now shares eight square miles of parkland with hikers and picnickers. P-22's story has helped us learn about the challenges many animals face while trying to survive in the city.

The Natural History Museum created a temporary exhibition all about this famous feline that brings you into his territory and describes the efforts of how NHMLAC staff, like Miguel, and the National Park Service tracks and learns from this charismatic cat.



"P" stands for puma, and "22" indicates that he was the 22nd mountain lion studied by the National Park Service in the L.A. region.

ACTIVITY

1

NATURE JOURNALING

Let's practice drawing or writing about what we see in nature, also known as nature journaling, to learn more about P-22 and his specialized physical features that help him survive.

Miguel uses camera traps to snap photos of P-22 and other wildlife all around Griffith Park. Look closely at this recent snapshot of P-22 from one of Miguel's wildlife cameras and use the space in the following pages to write about what you see:



(Image courtesy of Miguel Ordeñana)

4 NATURE JOURNALING

- 1 Describe P-22's physical features. What do you notice about the different parts of P-22's body?



(© Steve Winter)

2

Describe details about his environment. What do you notice about where P-22 lives?

Lined writing area with 12 horizontal lines.

3

Choose one physical feature you listed above and describe how it might help a mountain lion like P-22 survive in its specific environment:

Lined writing area with 12 horizontal lines.

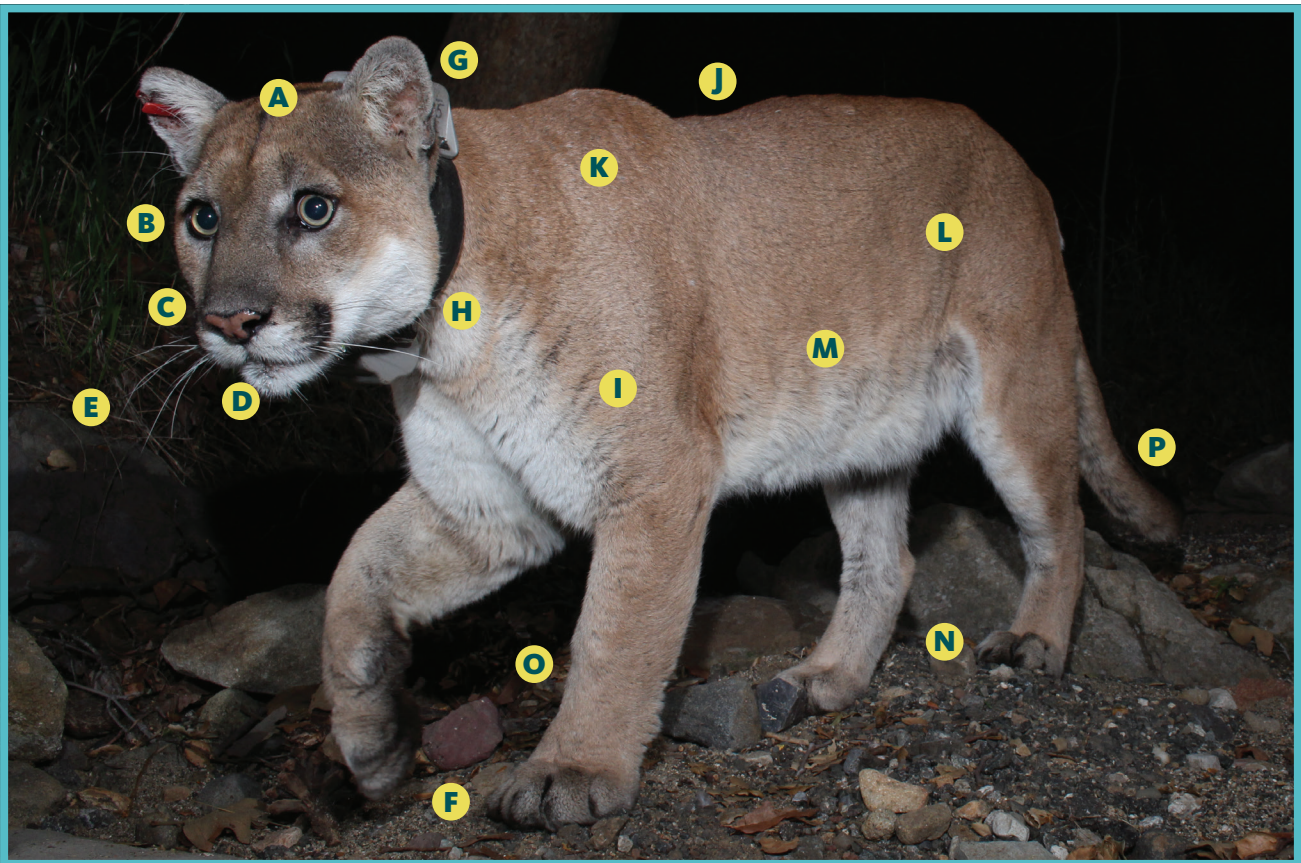
ACTIVITY

2

ANATOMY OF P-22

In thinking about what we journaled about before, let's learn more about P-22's anatomy (the size, shape, and structure of his body) and explore how his specialized features and senses help him survive in Griffith Park.

Take a look at the anatomical features of P-22 in the below photo. Just as we practiced in our journaling, consider how one of his physical features might help him survive in Griffith Park!



(Image courtesy of Miguel Ordeñana)

- | | | |
|------------------------------------|--------------------|---------------------|
| A. head | G. ears | M. rib cage |
| B. eyes | H. jaw | N. hindlimbs |
| C. nose | I. torso | O. forelimbs |
| D. mouth | J. spine | P. tail |
| E. whiskers | K. shoulder | |
| F. paws (retractable claws) | L. pelvis | |

Which specialized features on P-22's body help him survive in Griffith Park?

1 EXAMPLE: Ears - help him listen for prey

2

3

4

5

6

7

8

9

10

ACTIVITY
3

SCIENTIFICALLY ILLUSTRATING P-22

Now that we've gotten the hang of looking closely, let's learn how to draw a detailed observational sketch of P-22, also known as scientific illustration! Together, we'll create an observational drawing of P-22 using a reference image (a photo taken by one of Miguel's camera traps in Griffith Park).

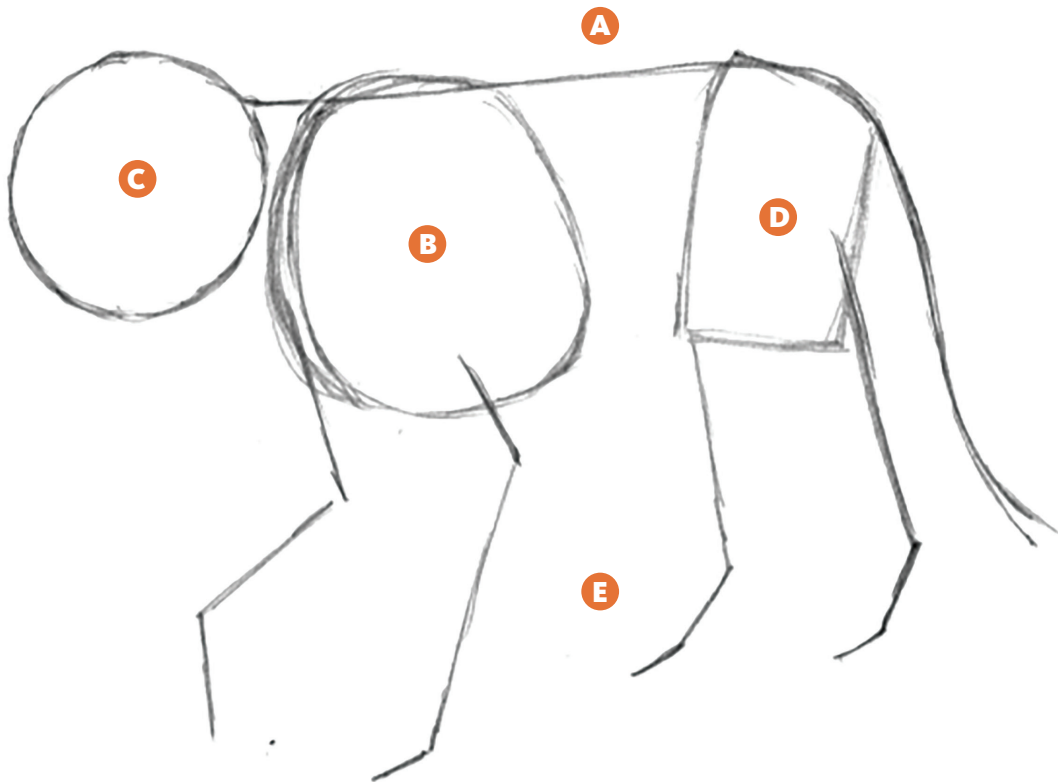
Begin by looking at our subject, P-22, and breaking this mountain lion down into basic shapes such as circles, lines, and rectangles. You can do this with any observational drawing!



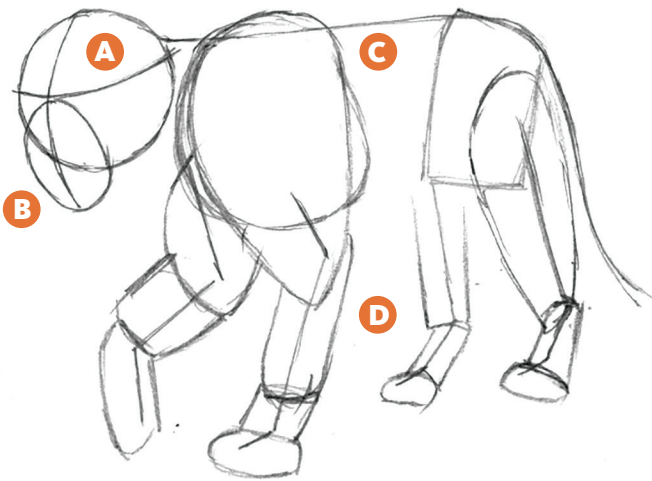
(Image courtesy of Miguel Ordeñana)

**STEP
1**

- A** Draw an action line for the spine, starting at the top of his head and ending with his tail.
- B** Draw an oval for the rib cage, or upper torso.
- C** At the top of the action line, draw a circle about half the size of his rib cage for his head.
- D** Place a slightly smaller rectangle for his lower torso, or pelvic area, where the action line bends down to represent his tail.
- E** Look at the photo and sketch in action lines for each of his four legs (forelimbs and hindlimbs).

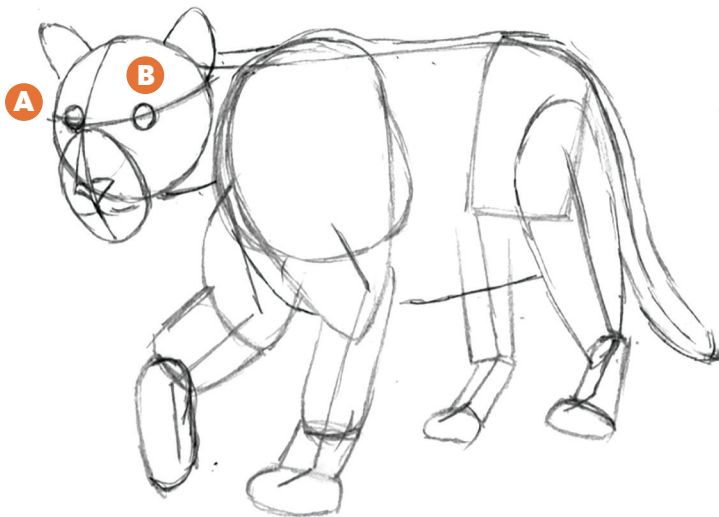


STEP
2

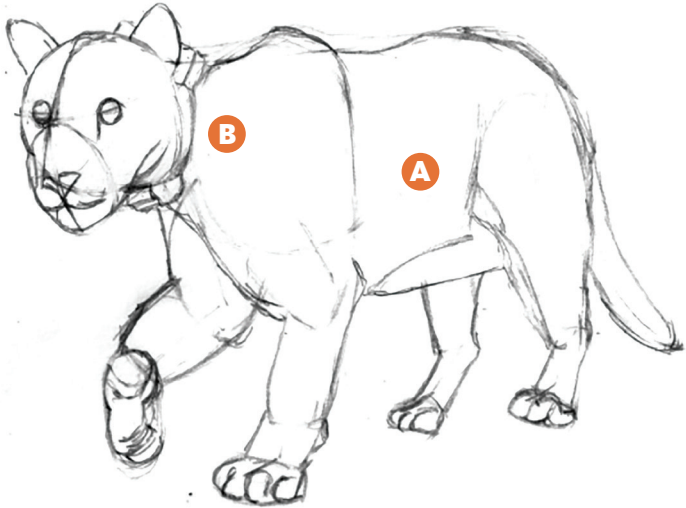


- A** Draw a curved horizontal line around his head at the halfway point to create his eyeline.
- B** Draw a curved vertical line as a guide for placement of his nose and mouth. Extend this line below his head to draw an oval for his nose, mouth, and jaw (the oval starts at his eyeline).
- C** Connect the front of his neck to his upper torso, then continue the line to his pelvic area to create the shape of his body.
- D** Use elongated rectangular and triangular shapes to add volume and mass for his legs and feet.

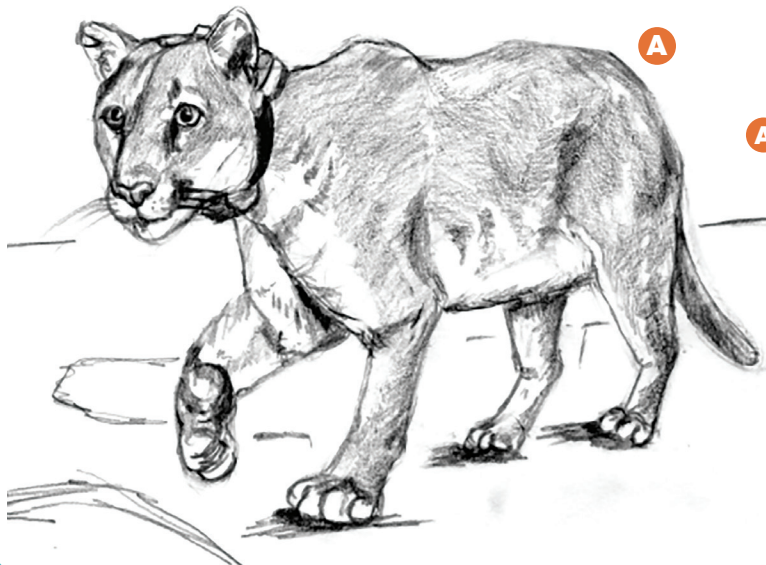
STEP
3



- A** Add two c-shapes as large as his nose, for his ears.
- B** Place his eyes between his ear and nose using the guidelines if necessary. Remember eyeballs are ovals, not circles!

STEP
4

- A** Erase out the guidelines as you add in details to his eyes, teeth, ears, body, legs, and feet.
- B** Draw P-22's GPS collar. What can we learn about P-22 when he's wearing this collar? How does wearing this collar benefit science?

STEP
5

- A** What did we notice about P-22's environment when we were nature journaling? Draw a simple background and make sure to include those details we noted! Add shading or color to your drawing. Make sure to sign and date your drawing. You've drawn P-22!

STEP
6

DRAW P-22

Using what you learned from Steps 1-5, draw your very own P-22 using the image below. For a larger image, go back to p. 8*.



*Larger image on p. 8

ACTIVITY

4

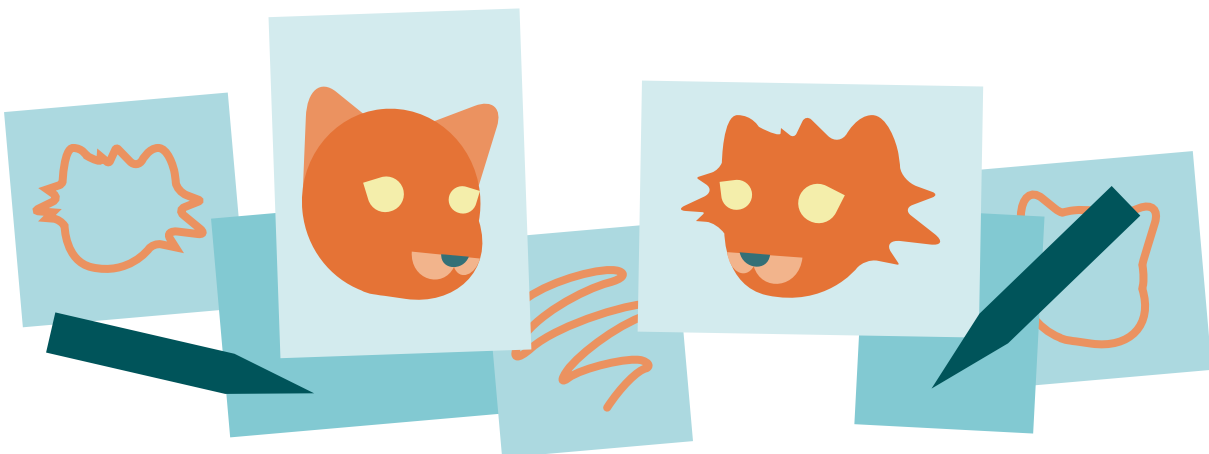
CLOSER THAN YOU THINK

Have you ever noticed that there are some similarities between mountain lions and cats? Animals like cheetahs and mountain lions belong to the puma lineage and are not closely related to other large cats like lions or tigers; instead, they are considered oversized small cats!

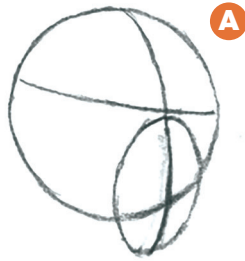
See if you can illustrate some headshots of P-22 and his distant relative, Shadow the house cat. Look closely at the anatomy of both of these cats. What looks similar? What looks different? Just like we did with our scientific illustration of P-22, begin with basic shapes and guidelines.



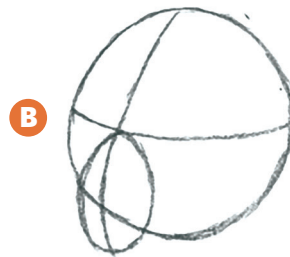
(P-22 image courtesy of Miguel Ordeñana and Shadow image courtesy of Karen Lukesh)



STEP
1

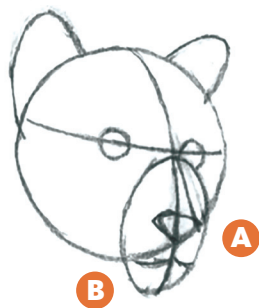


- A** Draw circles represent their heads. Notice how both of our subjects are looking slightly off to the side?



- B** Create a $\frac{3}{4}$ view of their heads by drawing a horizontal line wrapping around their heads at the halfway point of the circle to create their eyelines.

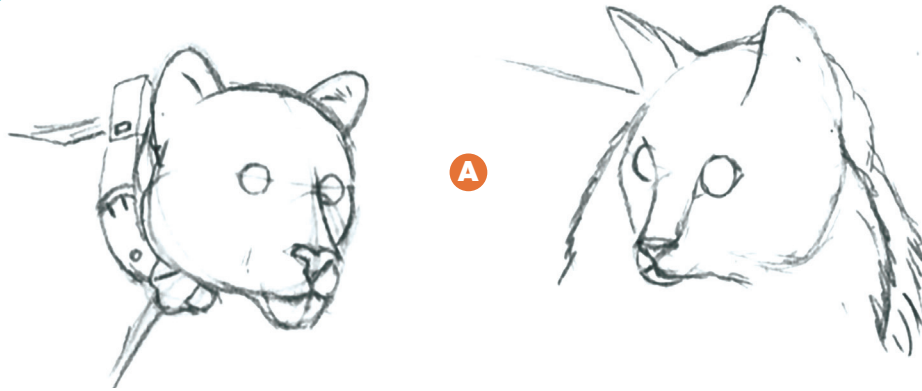
STEP
2



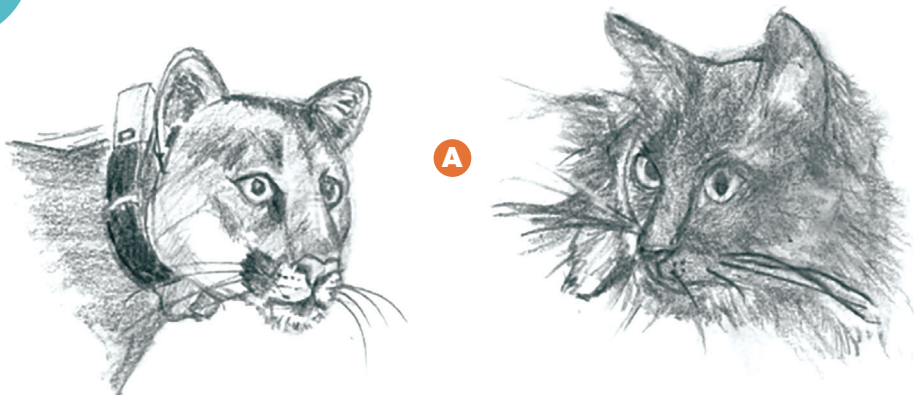
- A** Draw a vertical line as a guide for placement of their noses and mouths, then extend this line to create their noses and jaws.
- B** Draw an oval half as wide as the circle for their noses and jaws (this oval starts at their eye-line).



- C** On the horizontal line, place ovals for their eyes. Draw their noses by making a flat heart shape.
- D** Add the mouths underneath. Keep in mind the vertical guide represents the center of their faces. Draw upside-down u's a little bigger than their nose for their ears.

STEP
3

- A** Erase guidelines and refine the shape of their heads. Extend lines out from the head to add a simple neck for each. Sketch P-22's GPS and Shadow's fur.

STEP
4

- A** Add details to your drawings! Refer back to the photo as you add their pupils, eye and face markings, and whiskers. Add shading and final details to your drawing. Make sure you sign and date your drawing. You can go back and follow these same steps with a picture of your own pet!

STEP
5

DRAW P-22 & SHADOW THE HOUSECAT

Using what you learned from Steps 1-4, draw your very own P-22 and Shadow the house cat using the image below. For a larger image, go back to p. 13*.



*Larger image on p. 13



Concept & Activity Illustrations by Karen Lukesh

2019–2021 NHMLAC Teacher
Advisory Council

Karen Lukesh is a high school art teacher at Bell Senior High in Bell. As a Los Angeles native, Karen can't remember a time when the Natural History Museum wasn't an important part of her life! Throughout her childhood, Karen's father often took her and her siblings to NHM to nurture their love of science and nature. Years later, one of Karen's fondest memories was watching her father and her own three-year-old son roaming the Dinosaur Hall – as a single mom, it became one of their favorite weekend and holiday destinations. After becoming a high school art teacher, she discovered the weekend educator workshops hosted by the Museum, which she regularly attends for new inspiration in lesson plan building, engaging speakers, hands-on activities, and to view the latest exhibits. Being a part of TAC, the development of this P–22 lesson, working with peers, and meeting and collaborating with museum professionals has been such a rewarding part of her career.

STANDARDS

- VAPA: Creating Anchor Standard 3 - refine and complete artistic work
- Common Core ELA: RST.11–12.7
- NGSS: HS–LS2–6, HS–LS2–7, HS–LS2–8

“ Special thanks to Rachel Fidler for inviting me to apply for the TAC and seeing this P–22 drawing lesson to completion, to Miguel Ordeñana for nudging me towards focusing on P–22 for the lesson, allowing me to use his photos, and most importantly inspiring my students to explore scientific career paths, to Becca Wilcox for sharing her paleoart unit with my students during a time when we couldn't go outside but we could travel back in time, and to all the staff at the Museum for their support on this project. ”

RESOURCES



The Curiosity Show: L.A.'s Griffith Park Mountain Lion with Miguel Ordeñana

Hear about Miguel's discovery of P-22 in Griffith Park in this short video



The Sound of Our Griffith Park Mountain Lion: P-22 and the Mysteries of Puma Communication

Read all about Miguel's research and hear the call of P-22



The Cougar Conservancy

Learn more about how you can support and protect local mountain lions



***Opening the World Through Nature Journaling* by John Muir Laws**

Dive deeper into nature journaling and scientific illustration with John Muir Laws' books and articles

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