

Constellation Transformation*

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Background: The constellations in this activity were chosen because they represent animals or objects familiar to students of many ages. The stars in the illustrations are represented by circles of several sizes as they would appear on a planisphere or star chart. The *largest* circles in the patterns indicate the *brightest* star(s) in each constellation; the *smallest* circles indicate the *dimmest* stars.

The circle sizes are not necessarily equivalent to the star *sizes*; the circle sizes represent the stars' *apparent brightness* to an observer on Earth. For example, a large star (a giant or super giant) might appear dim because of its distance or cool temperature. A smaller star might be closer and hotter, making it look bright to an observer.

Star colors range from red (coolest) to orange, yellow, white, and blue (hottest). Our Sun is a medium-sized star, yellow in color (medium temperature), and spherical (a ball) in shape. Even young students frequently represent the Sun as a yellow circle in their drawings — the correct shape and color for our Solar System's star!

Objectives: Students will identify common constellation patterns. They will create their own constellations using the same star patterns. Students will write a poem about the transformation (old → new constellation picture) or a short story about their newly-created constellation. Students should acknowledge the difference between an artistic representation of a star (five points, random colors) and a scientific representation of a star (a circle to represent a spherical object, larger circles for brighter stars).

Materials:

- Xerox paper (8-1/2 x 11)
- Crayons or markers, pencils
- Staples
- Constellation patterns and text
- Poetry sample
- Lined paper for story telling (optional)

*Adapted from “Creative Constellations,” E. Redondo and A.-A. Robles, “Science Sparkler,” *Science and Children*, September, 1994.

Procedure:

1. Introduce the students to some common constellations such as Ursa Major. Show the example of just the star pattern and the star pattern with the great bear drawn around the stars. A sample is enclosed. Brainstorm ways that students can create their own constellations from this star pattern.
2. Distribute the constellation patterns supplied, or make your own for additional constellations. It is important to use accurate star patterns so that the students will be able to recognize these constellations in the sky or planetarium.
3. Ask the students to identify the nine constellations: Lepus (The Rabbit), Canis Major (The Great Dog), Corona Borealis (The Northern Crown), Draco (The Dragon), Cygnus (The Swan), Ursa Major (The Great Bear), Leo (The Lion), Scorpius (The Scorpion), and Delphinus (The Dolphin). Point out that the plain star patterns (no figure drawn around them) contain the same number of stars in the same pattern as those with the dog, rabbit, etc. drawn in.
4. Ask the students to create their own “constellations” from the plain star patterns. Each student can make their own book, or small groups can contribute to a collective book. Use crayons, markers, or colored pencils to decorate the constellations.
5. The master copy of the constellations has the English and Spanish texts printed below the figures. For younger students, you may wish to leave the text on your master copy, allowing them to fill in the blank spaces. You can also block out the text when copying the pages. Allowing the students to print or write the entire text below the figures.
6. OPTION: A format for a transformation poem is included. Students can choose their favorite created constellation and write a poem about it, or the students can write the poems beneath the figures (two lines under the pre-drawn constellation, two lines under their created constellation), or on a separate sheet of paper. Samples are included.
7. OPTION: Share myths and legends about the constellations with the students. Ask the students to write a legend about their created constellations.
8. Have the students share their new constellation patterns (and their poems) with the class.

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CONSTELLATION TRANSFORMATIONS POETRY VERSION

I used to be a/an (name of figure in constellation)

(Second line: information about figure in first line)

But now I am a/an (name of new figure in constellation)

(Fourth line: information about figure in third line)

Second and fourth lines must rhyme.

EXAMPLE:

If a student changed Ursa Major, the Great Bear, into a kangaroo, they might write:

I used to be a dipper

For scooping up cool water,

But now I am a kangaroo

In my pouch you'll see my daughter.

Resources:

Observing Guides

H. A. Rey., 2008. Stars: A New Way to See Them. Houghton Mifflin.

H. A. Rey, 2008. Find the Constellations. Houghton Mifflin.

I. Ridpath and W. Tirion, 2012. The Monthly Sky Guide, 9th ed. Cambridge University Press.

Tours of the Night Sky. (CDs available from the Astronomical Society of the Pacific; <http://www.astrosociety.org>)

G. Consolmagno and D. Davis, 2011. Turn Left at Orion. Cambridge

Myths and Legends (stars and constellations)

J. Staal, 1988. The New Patterns in the Sky. McDonald and Woodward Publishing Co. (Adult-level resource book)

TEXT FOR CONSTELLATION TRANSFORMATION BOOK

I used to be a dog, now I am _____.
Antes era un perro, ahora soy _____.

I used to be a rabbit, now I am _____.
Antes era un coneje, ahora soy _____.

I used to be a crown, now I am _____.
Antes era una corona, ahora soy _____.

I used to be a swan, now I am _____.
Antes era un cisne, ahora soy _____.

I used to be a dragon, now I am _____.
Antes era un dragón, ahora soy _____.

I used to be a scorpion, now I am _____.
Antes era un alacrán, ahora soy _____.

I used to be a dolphin, now I am _____.
Antes era un delfín, ahora soy _____.

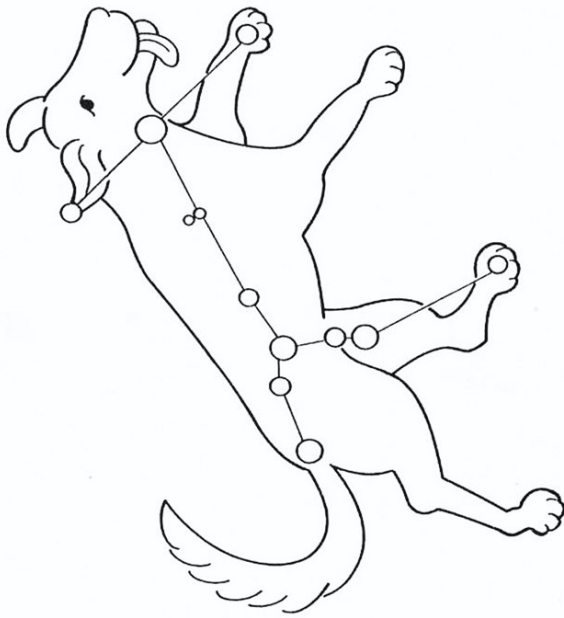
I used to be a lion, now I am _____.
Antes era un león, ahora soy _____.

I used to be a bear, now I am _____.
Antes era un oso, ahora soy _____.

Patterns Provided:

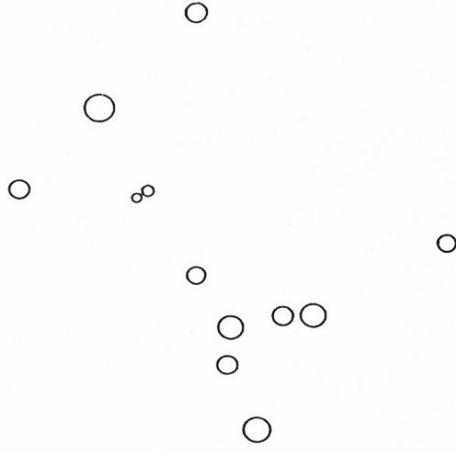
Canis Major (Greater Dog), Lepus (Rabbit), Corona Borealis (Northern Crown),
Cygnus (Swan), Draco (Dragon), Scorpius (Scorpion), Delphinus (Dolphin), Leo
(Lion) , Ursa Major (Great Bear)

Canis Major



I used to be a dog,

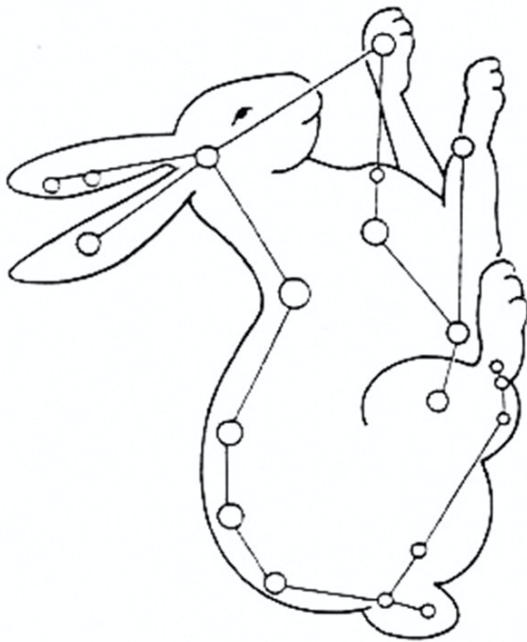
Antes era un perro,



now I am _____

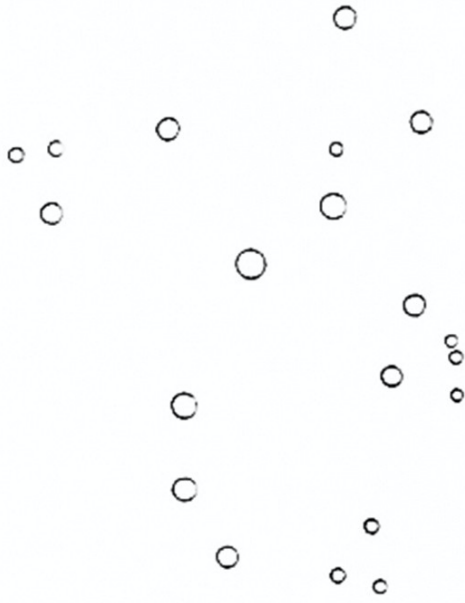
ahora soy _____

Lepus



I used to be a rabbit,

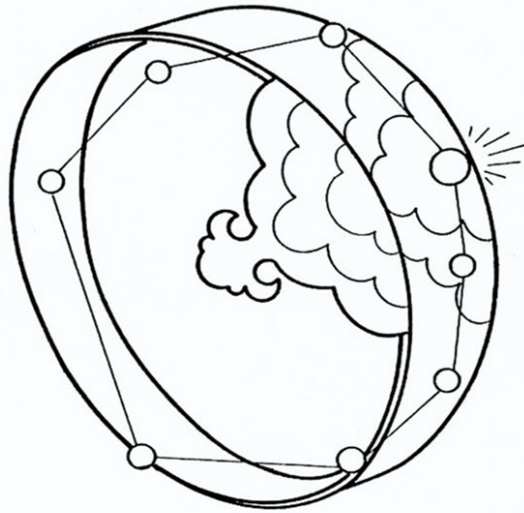
Antes era un coneje,



now I am _____.

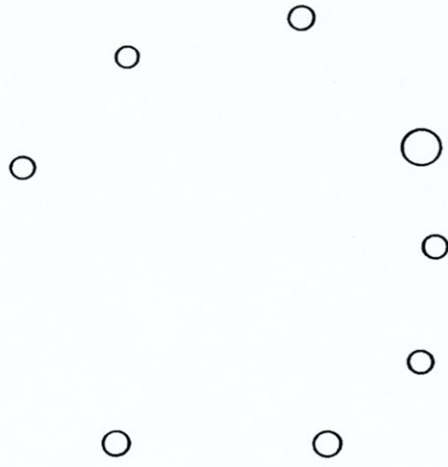
ahora soy _____.

Corona



I used to be a crown,

Antes era una corona,



now I am _____.

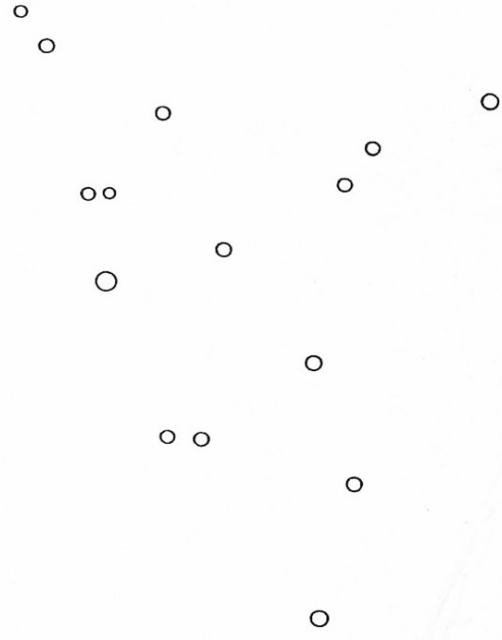
ahora soy _____.

Cygnus



I used to be a swan,

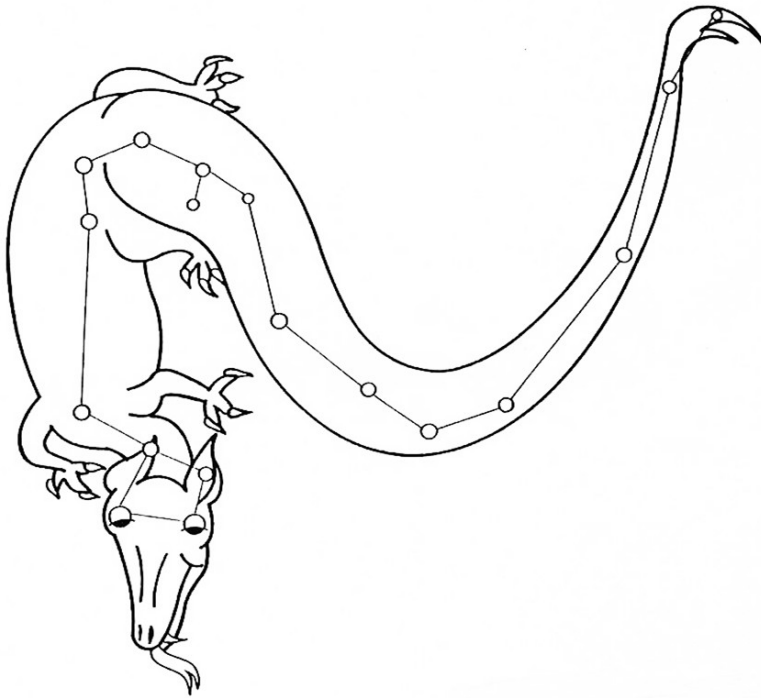
Antes era un cisne,



now I am

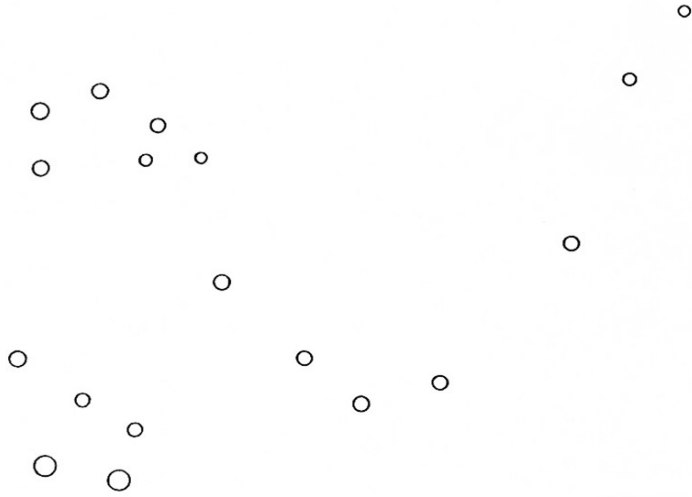
ahora soy

Draco



I used to be a dragon,

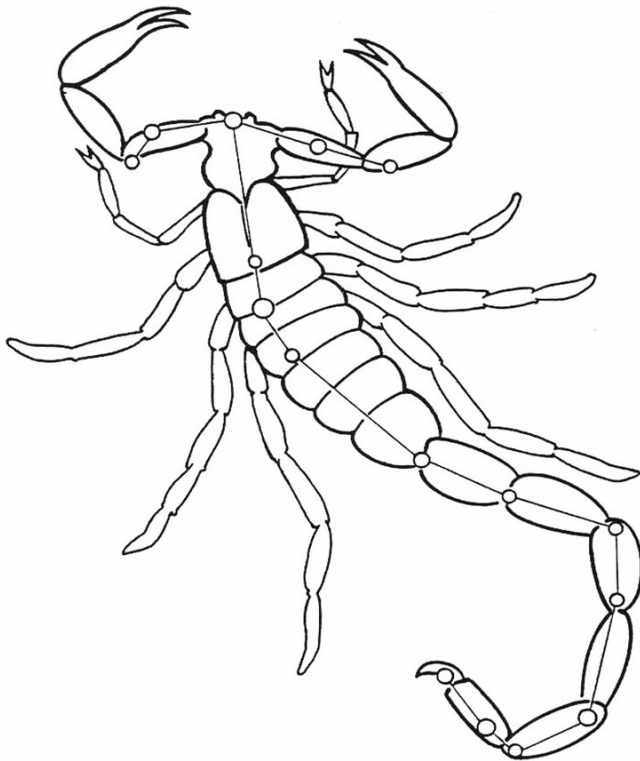
Antes era un dragón,



now I am _____.

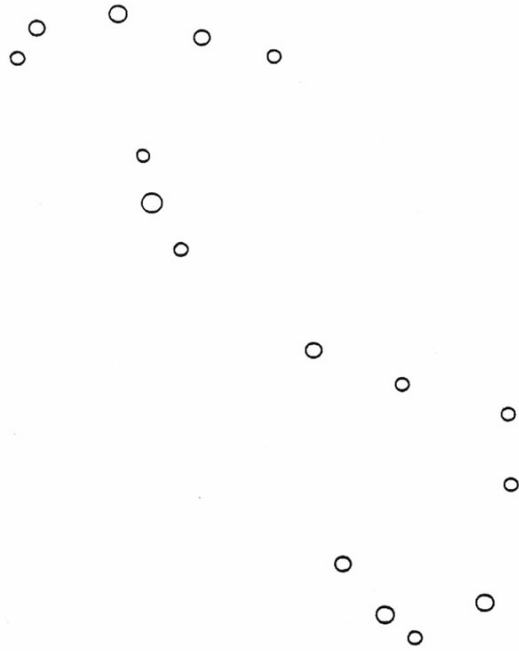
ahora soy _____.

Scorpius



I used to be a scorpion,

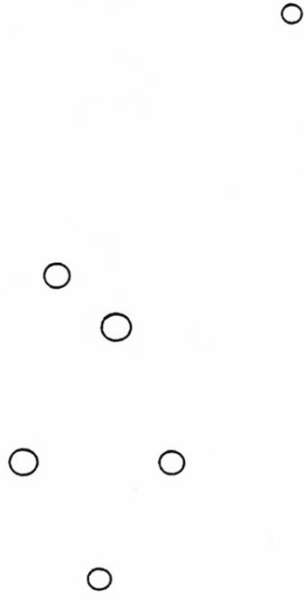
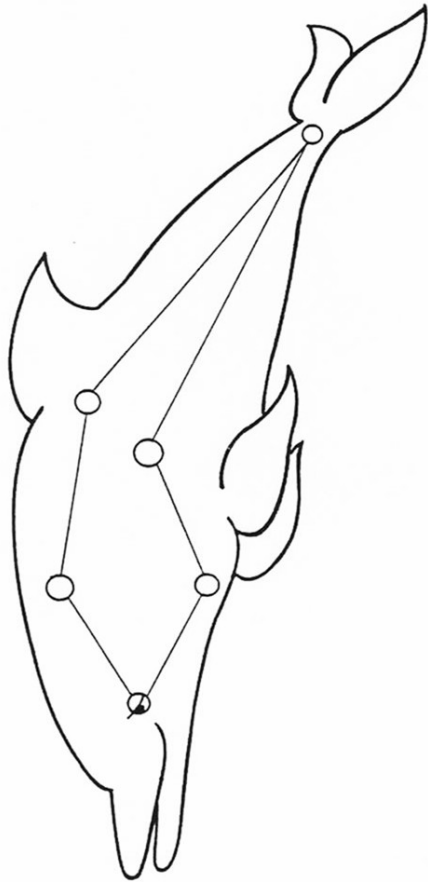
Antes era un alacrán,



now I am _____.

ahora soy _____.

Delphinus



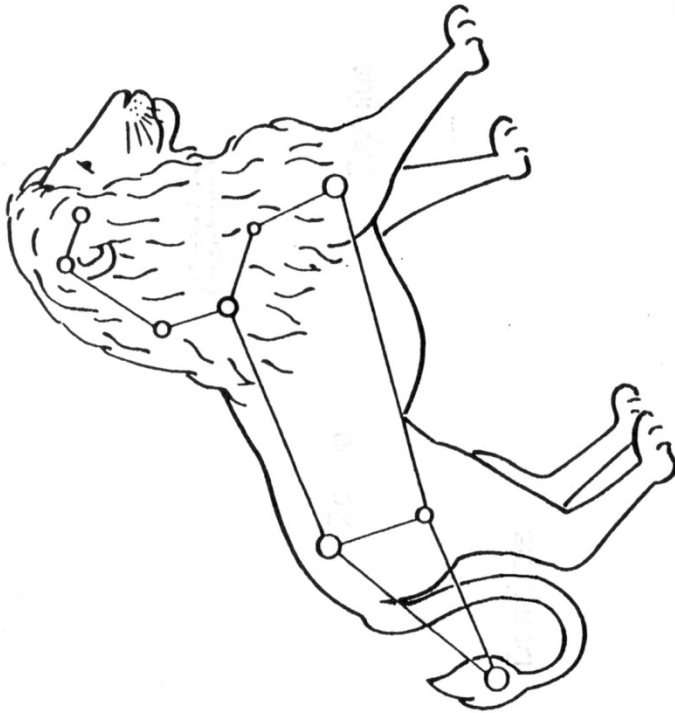
I used to be a dolphin,

now I am _____.

Antes era un delfín,

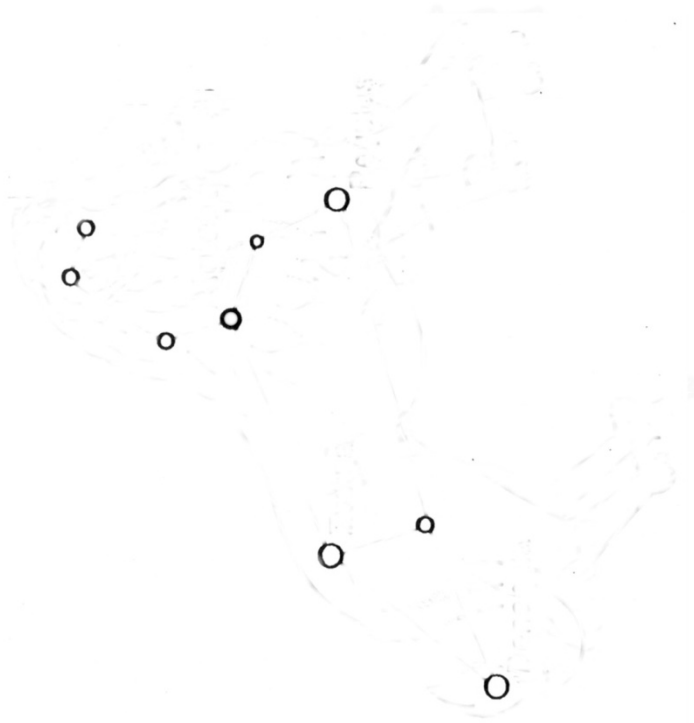
ahora soy _____.

Leo



I used to be a lion,

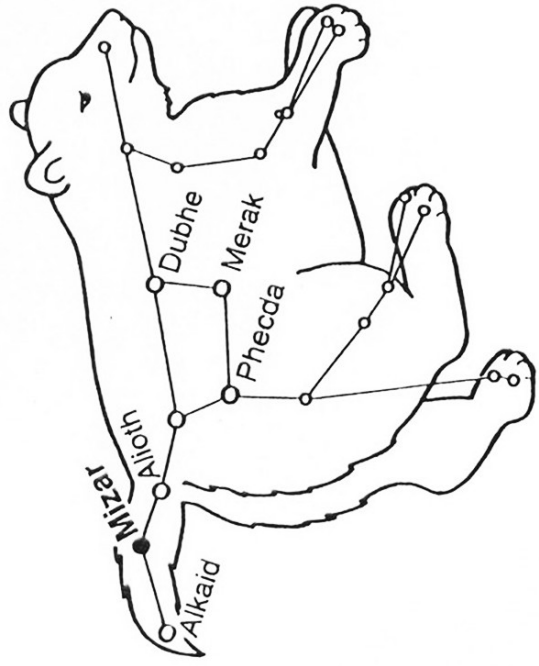
Antes era un león,



now I am _____.

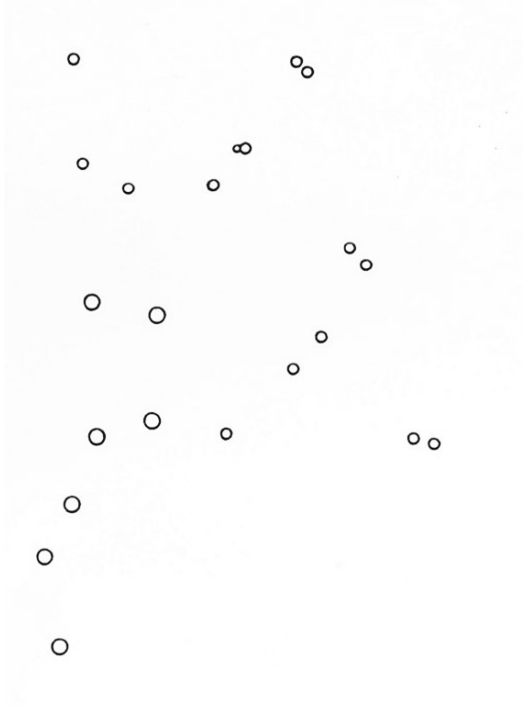
ahora soy _____.

Ursa Major



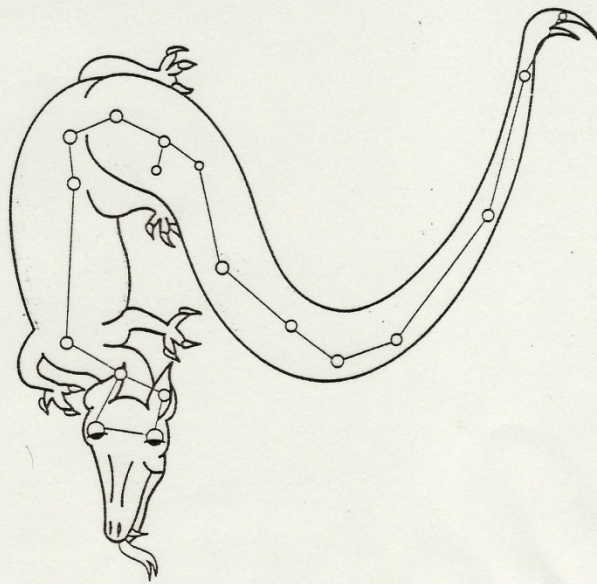
I used to be a bear,

Antes era un oso,

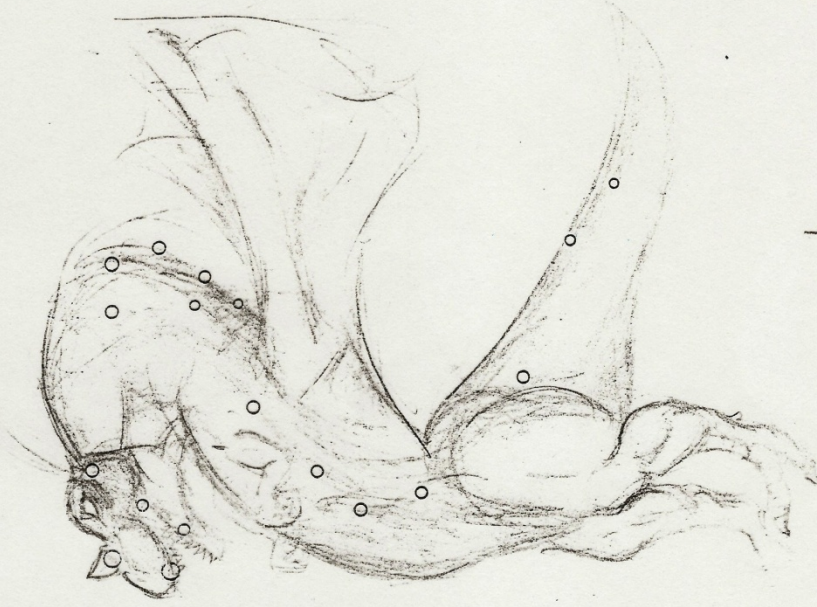


now I am _____.

ahora soy _____.

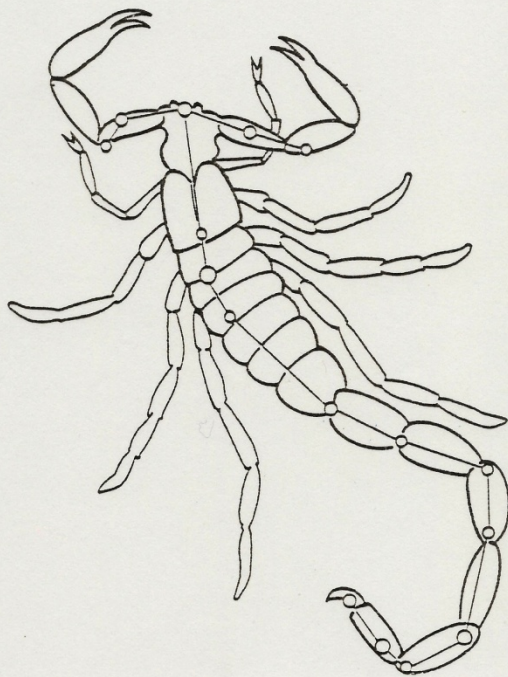


I used to be a dragon,

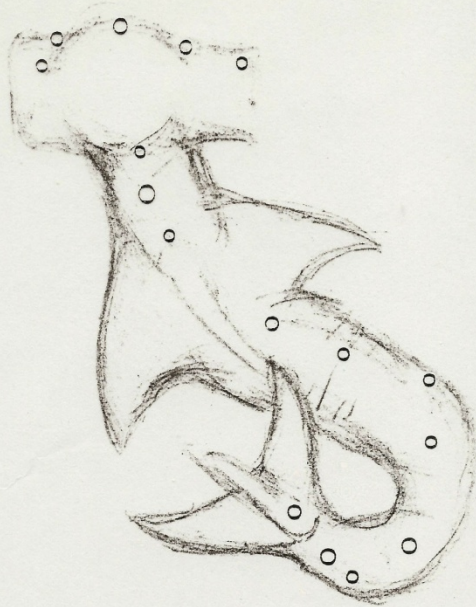


now I am a dragon.

a dragon



I used to be a scorpion,



now I am a Hammerhead
shark

a Hammerhead Shark



**I used to be a dog,
Who'd always play with all.
But now I am a boy,
Who plays only with his ball.**

Ignacio Reyes



**I used to be a dragon,
With breath so hot.
But now I am a tadpole,
With bright red spots.**

Faith Romero