

PEGASUS AND THE NIGHT SKY

Lesson Guide #2 for *Up Where the Stars Are*

Concepts

- Stars
- Constellations
- Patterns of movement (and predictability)



Objectives

- Learn about stars, including what they are made from and how far away they are.
- Learn about constellations, with a focus on Pegasus.
- Identify apparent patterns of movement in the night sky in order to predict where to look for Pegasus.

What Is a Star?

In *Up Where the Stars Are*, Andrew goes stargazing with his parents. Have you ever looked at the stars in the night sky? Believe it or not, those tiny dots of light are actually giant balls of burning gas. They are very hot and very bright. Many stars are bigger, brighter, and hotter than the sun (which is also a star)! So why does the sun look so big, and why do the stars look so small? That's because the sun is *much* closer to us than any other stars. Imagine putting a ball on the floor to represent Earth and another ball 1 inch away to represent the sun. The ball that represents the next closest star would be more than 4 miles away!

NOTE: Earth's average distance from the sun is about 93,000,000 (93 million) miles. The next closest star, Proxima Centauri, is about 25,000,000,000,000 (25 trillion) miles away.

What Is a Constellation?

For thousands of years, people have been gazing at stars. Some people used their imaginations and saw shapes in the stars. The shapes were given names and stories, and they became constellations. So a constellation is a group of stars that form a shape. There are 88 official constellations. To our eyes, the stars in each constellation appear close together. Most stars are actually very far apart—just like the sun is very far from its next closest star.

Thousands of years ago, people read the stars for various reasons. For example, farmers used stars as a calendar, so they knew when to plant their crops. Travelers used stars as a compass, so they always knew which direction they were going. The constellations and their stories helped people learn the stars and remember them.

The Constellation Pegasus

One of the best-known and easiest-to-find constellations is Pegasus. You might know Pegasus from your favorite books and television shows—and, of course, the winged horse plays an important role in *Up Where the Stars Are*. But Pegasus is originally a character from Greek mythology.

As the story goes, Pegasus was created from a drop of blood. He sprang to life after the hero Perseus defeated a monster named Medusa. After Pegasus learned to fly, he soared to Mount Olympus to live with the gods. Pegasus served the god Zeus by carrying his lightning bolts across the sky.

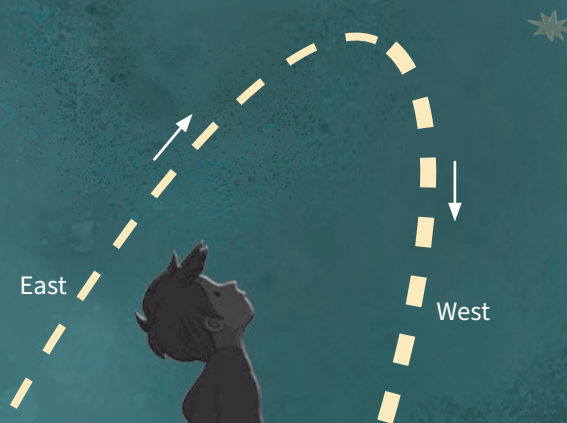


TIP: To find Pegasus, look for the four bright stars that form a crooked square.

Pegasus—and other constellations—appear to move across the night sky from hour to hour and day to day. Yet the stars always stay together; they never drift apart. That's because the stars (and the constellations) aren't actually moving as they seem to be. Earth is moving! The constellations seem to move over time—and sometimes turn sideways or upside down—due to Earth's rotation on its axis, or its spin, and due to Earth's orbit around the sun.

Patterns of Movement

Since the stars aren't moving (Okay, they *are* moving, but they don't appear to move because they're so far away) and since Earth's rotation is always the same, the apparent path of every constellation follows a pattern. This pattern is similar to the sun's: Generally speaking, stars appear to rise in the east and set in the west. The stars do not travel straight up and down, though. Their upward paths move diagonally toward the south. Their downward paths move diagonally back toward the north. Consider this sample path:



The path remains consistent, but a constellation's location on the path changes over time. Yet a constellation's path and pattern repeat each year (because it takes one year to orbit the sun). If your family went outside tonight and took a photograph of the stars and then did the same thing next year in the same place at the same time, you would find the stars in the same places.

Now that we know this, let's consider the path of Pegasus in the night sky. The sample path on the previous page is a fair representation of his path. Like most constellations, Pegasus follows an arc (or rainbow) type of path. That doesn't mean you'll always find him starting or ending at the bottom of the arc. Sometimes, when the sun sets, Pegasus will already be part of the way through his path. But it's helpful to know that his journey begins in the east, gets very high in the sky (almost straight above us), and ends in the west.

Pegasus is considered a fall constellation, so he's easiest to find during the fall months, especially mid-September to mid-October. If your family went outside around your parents' bedtime (10 p.m.), Pegasus would be very high in the sky, around halfway through his path.

However, as we learned, a constellation's location on the path changes over time. If you were to look for Pegasus earlier or later in the night—or at a different time of year—he would be at a different place along his path. (And his path circles all the way around the other side of Earth, so you might not see him at all!)

Make Predictions About Pegasus

We can use this information to make predictions about Pegasus. Consider these questions:

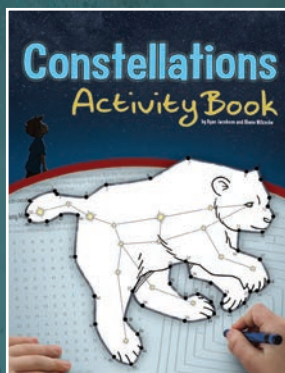
1. If you see Pegasus in the east, will he be getting higher or lower in the night sky?
2. If you see Pegasus in the west, will he be getting higher or lower in the night sky?
3. If you see Pegasus almost straight above your head, which direction will he move? (Or in which direction should you look for him later?)
4. Pegasus is almost straight overhead at 10 p.m. on October 1. Which direction would you look for him at 10 p.m. in July (a few months *earlier*)?
5. Which direction would you look for him at 10 p.m. in January (a few months *later*)?

Student Activities

For Pegasus-related fun, utilize the following pages from the *Constellations Activity Book*.

Sources

Information is from the following books by Adventure Publications. For more about constellations and the night sky, be sure to check them out.



PEGASUS

THE WINGED HORSE

Find stargazing titles at
advkeen.co/stargazing



Best Way to Find It (about 10 p.m.)



Look this high ... September to October ... facing south ... for this star pattern.



Pegasus is one of the easiest constellations to find in autumn.

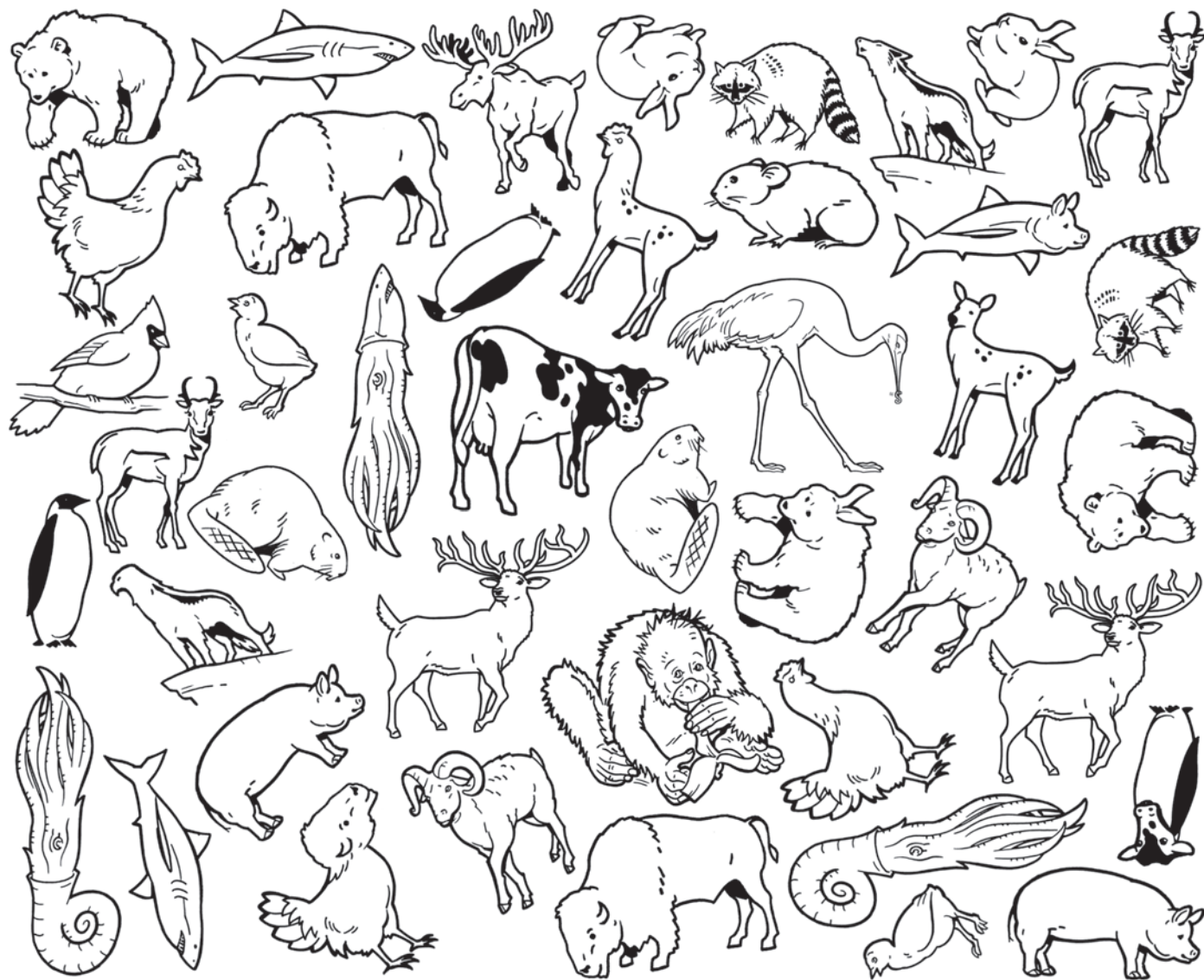
As the Story Goes

Pegasus (PEG-uh-sus) was a winged horse. He was created from the blood of a monster named Medusa. Pegasus sprang to life after the hero Perseus defeated Medusa. After Pegasus learned to fly, he soared to Mount Olympus to live with the gods. Pegasus served Zeus by carrying his lightning bolts across the sky.

ALSO CHECK OUT: Andromeda, Cassiopeia, Perseus

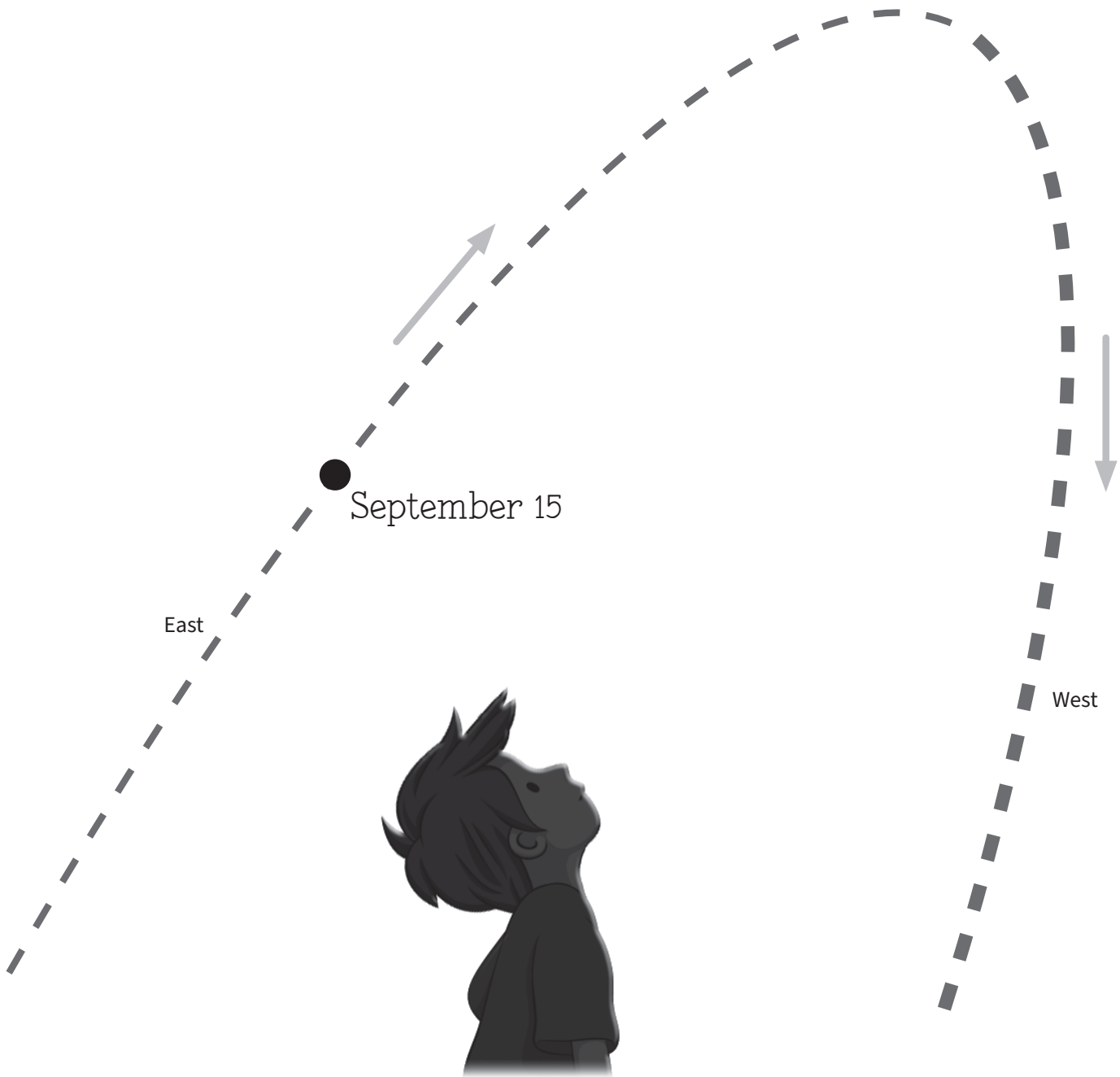
Animal Mix-up

Pegasus was a mix between a horse and a bird. In the picture below, circle all of the other animals that are mixed up. How many can you find?



HOME CONNECTION

For educational family fun, track Pegasus along his path. Beginning around September 15, go outside at 7:30 p.m. (Children should do so with an adult.) Face directly south and look to your left (east) to find Pegasus. Draw a dot on the arc below that represents where Pegasus is located, and label it with the date. Repeat this at the same time of night about once every week until Pegasus is no longer visible above the western horizon.



NOTE: Pegasus may not be visible on any given night due to clouds, weather, or light pollution (too much human-made light, such as in a busy city). For best results, look for Pegasus from a dark area on clear, cloudless nights.