



LIFE IS ART

TIME & AUDIENCE LEVEL

- K through 12th grade
- About 30-40 minutes

VOCABULARY

Blood
Erythrocytes
Leukocyte
Thrombocyte
Plasma
Hematology
Nucleus
Packed cell volume
Glucose
Total proteins

MATERIALS

- Pens/pencils
- Paper; if using watercolors, watercolor paper is best
- Paint– can be watercolor paint, acrylic paint, etc.
- Paint brushes
- Cups or bowls, filled with water if using watercolors
- Table covering if craft will be messy
- Page 4 of this Guide - Reptile Blood Cell Images; may be printed or on computer screen

SUMMARY

What is blood? Why is it important? Blood is a specialized fluid that circulates through the body. It carries essential substances and nutrients, and can transport waste. Learn about sea turtle hematology (the study of blood) and then create your very own blood cell!

OBJECTIVES

- Introduce the function of blood and why it is important
- Learn about the different parts of blood
- Learn about hematology and why it is important in vet medicine
- Find differences in various types of reptile blood
- Create a blood cell

BACKGROUND INFORMATION

Blood is a specialized bodily fluid in humans and other animals that has a very important function. Blood carries and delivers necessary nutrients and oxygen throughout the body; it also transports waste products away from cells.

While blood may seem as if it is all one substance, there are actually several parts and several types of cells that together form blood. There are red blood cells (**erythrocytes**), white blood cells (**leukocytes**), and platelets (**thrombocytes**). These cells are all suspended in **plasma**, a clear fluid that is mostly water and makes up about 55% of blood.

Each type of cell has a different function. Red blood cells help to deliver oxygen throughout the body tissues. White blood cells help to fight infection and protect your body against foreign invaders, such as bacteria and viruses. Platelets help heal wounds and prevent bleeding by forming blood clots.

Looking at the blood of sea turtle patients can help us to diagnose health issues and allow us to make decisions about medications and treatment. Sea turtle **hematology** is the study of blood as it relates to the cause, diagnosis, treatment, prognosis, and prevention of diseases. Evaluating blood provides a tool for assessing the body's response to a disease and/or treatment.

CRITICAL THINKING QUESTIONS

Why is blood important?

Why do you think blood cells look different in different types of reptiles?

GEORGIA SCIENCE STANDARDS:

S7L2. Obtain, evaluate, and communicate information to describe how cell structures, cells, tissues, organs, and organ systems interact to maintain the basic needs of organisms.

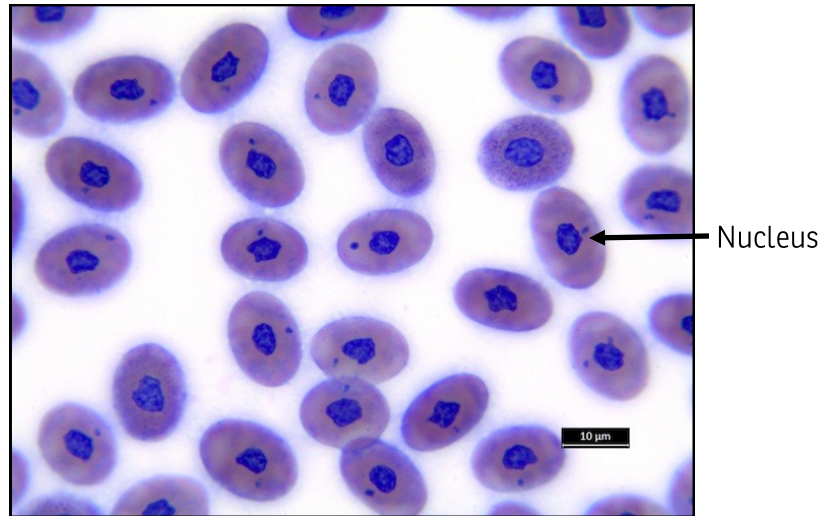
Blood Image Sources

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DrMedVet, DACVP (Clinical)

Department of Large Animal
Clinical Sciences - Aquatic An-
imal Health Program, College
of Veterinary Medicine, Univer-
sity of Florida and Disney's An-
imals, Science, and Environ-
ment Team, Disney's Animal
Kingdom

Sea turtle blood is unique. As with every reptile, all sea turtle blood cells have a **nucleus**, which is where the genetic material is found in the cell. In humans, only white blood cells have a nucleus.

Here is an example of sea turtle blood cells:



To see other example images of reptile blood cells, go to Page 4 of this guide.

One of the first things that happens when a new patient is admitted to the Georgia Sea Turtle Center is collection and analysis of bloodwork. Looking at blood values can tell us about the health of the turtle. One value that we look at is called **packed cell volume**. Packed cell volume, also known as PCV, is the percentage of red blood cells circulating in the blood. A healthy sea turtle will have a PCV between 25-35%. A value under 25% indicates that the turtle is anemic. Another blood value we look at is the **glucose** level, or the amount of sugars in the blood. This is the body's main source of energy. If the glucose is low, it tells us that the turtle has not been eating. A final common blood value we analyze is **total proteins**. Total protein is the amount of protein in the plasma; this value is used to ensure the immune system is working properly. It allows us to see if there is any inflammation in the body and can tell us if the turtle is dehydrated upon arrival. Together, these values determine a patient's course of treatment as well as any additional needs.

SET UP

Gather and organize all of your materials on a table. If younger children are participating, you may want to cover the surface of the table with paper to keep area clean.

INTRODUCTION

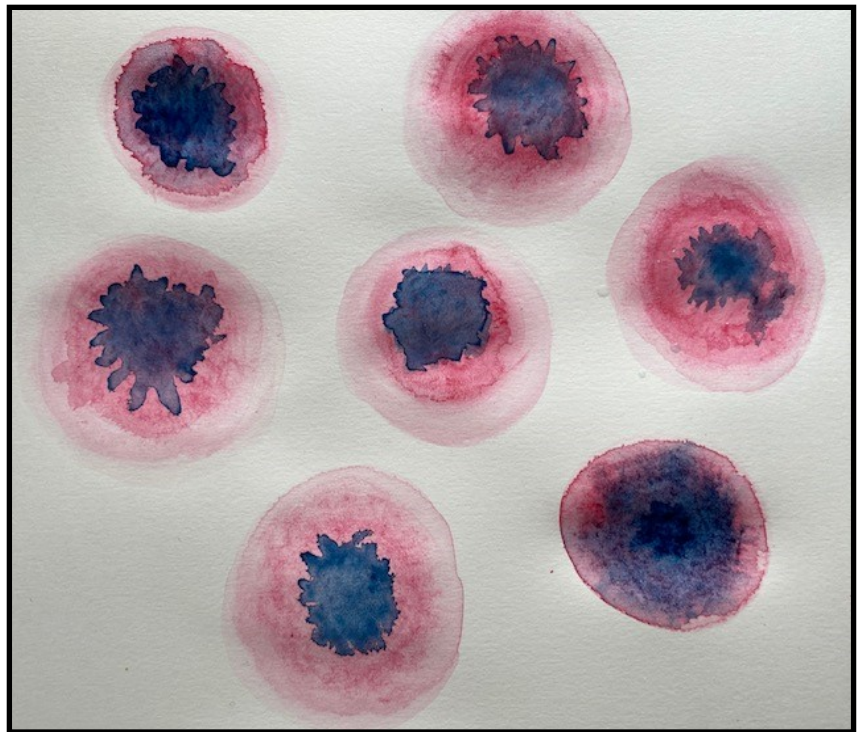
Start by asking children if they know what blood is and why it is important. Discuss the different parts of blood (red blood cells, white blood cells, and platelets) and what each part does to help a body function. Relate each part of blood back to hematology.

ACTIVITY PROCEDURE

1. Have children look at images of sea turtle blood cells and reptile blood cells. Have them discuss what colors they see and what differences they see between different cells.
2. Using what they have seen, have children paint their own blood cells.
3. After the blood cells have been painted, ask children why they have chosen the colors, shapes, and design of their cell.
4. Optional: Have children label the nucleus of one or more blood cells that they have drawn.

CONSERVATION MESSAGE

Blood is an important part of sea turtle health. It may explain why sea turtles strand (wash ashore) on beaches, or why a turtle is not healthy. It is important that they get the care that they need because all sea turtles in the United States are protected under the Endangered Species Act. If you ever find a sea turtle on the beach or floating in the water, call your local wildlife authorities to get help. In Georgia, the Department of Natural Resources can be reached through the sea turtle and marine mammal hotline at 1-800-2-SAVEME.



Example watercolor painting of reptile blood cells

Georgia Sea Turtle Center Contact Information

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Reptile Blood Cell Images

