

STANDARD



BEADS OF BLOOD

FOCUS Blood

OBJECTIVE To explore blood composition

OVERVIEW Ever wonder what makes up that fantastic fluid that flows through your veins (and arteries, too)? In this activity, we'll explore the composition of blood by making a model.



WHAT TO DO

STEP 1



Pour the bag of large red beads into the plastic jar. Now carefully examine the small bag of "mixed" beads. Make notes about quantities, shapes, and colors. Pour this bag of beads into the jar with the red beads.

STEP 2



Pour the bag of tiny orange beads into the jar. Slowly fill the jar with water and fasten the lid on firmly. Dry the outside of the jar carefully, then shake the jar to thoroughly mix the beads.

STEP 3



Hold the jar in one hand and swirl it gently. Watch the beads as they slowly spin. Make notes about what you see. Predict what each type of bead might represent (hint: check bag labels).

STEP 4



Carefully pour the water out of the jar. Sort and dry beads as directed by your teacher. Now review each step in this activity. Share and compare observations with your research team.

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Seela Science® BEADS OF BLOOD • 1

National Standards

Focus: C1

Related: A1, A2, B1, C1, C3, C5, F1, G1, G2

Category

Life Science

Focus

Blood

Objective

To explore blood composition

Materials Needed

plastic jar
red blood cell beads
white blood cell beads
platelet beads
water

Safety Concerns

3. Hygiene

Make sure students keep the beads out of their mouths.

4. Slipping

Both the water and the beads can pose a slipping hazard! Clean up any spills immediately. Remind students to exercise caution with both beads and fluids.

Additional Comments

For added effect, you can require students to use medical-style latex gloves (perhaps donated by a local medical center). This models the correct procedure for handling human fluids like blood. By changing the number of beads, students can model various blood disorders: fewer platelets = hemophilia; red beads cut in half = sickle cell anemia; extra white blood cells = leukemia or a bacterial infection. After the activity is completed, have students carefully dry and sort the beads for use next year.

Overview


Read the overview aloud to your students. The goal is to create an atmosphere of curiosity and inquiry.

WHAT TO DO

Monitor student research teams as they complete each step.

Step 1

Repeat cautions about handling beads and water (Safety Issues) just before students begin this activity.

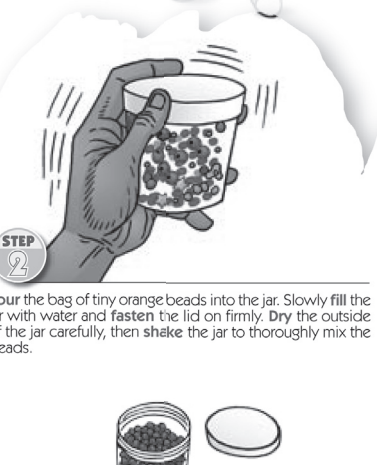

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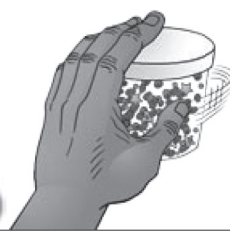
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Teacher to Teacher

Your blood type reflects the genes you inherited from your parents. The major blood types are A, B, AB, and O. In addition, blood has an Rh factor (named for the Rhesus monkeys where it was first detected). If you have the Rh antigen, you are Rh positive (Rh+). If you don't, you're Rh negative (Rh-). Roughly 38% of people have type O+ and about 34% have A+. The

other six combinations each account for less than 10% of the population. In an emergency, anyone can donate type O red blood cells. Type AB individuals can receive red blood cells of any blood type.

People with type O- are known as "universal donors," and people with type AB+ are known as "universal recipients."

WHAT HAPPENED?

Here's what the parts of your model represent: First, human **blood** is primarily a water-based liquid called **plasma** (represented by water). Plasma contains dissolved **nutrients**, **waste products**, **gasses** like carbon dioxide and oxygen, disease-fighting chemicals called **antibodies**, chemical messengers called **hormones**, and many other substances. Plasma also moves **heat** to warm up or cool down the body.

Second are **red blood cells** (represented by the red beads) called **erythrocytes**. They get their color from **hemoglobin** they contain. This iron-rich chemical helps carry oxygen. Next are **white blood cells** (represented by the other colored beads) called **leukocytes**. It's their job to fight **disease!** There are five different types of leukocytes. Finally come small, specialized cells (represented by the tiny beads) called **platelets**. These important cells cause blood to **clot** during an injury, preventing the loss of life-sustaining fluid!

WHAT WE LEARNED

- 1 a) plasma b) plasma moves heat around to warm or cool the body; it also transports nutrients, waste products, gasses, antibodies, hormones, and other substances
- 2 a) red blood cells b) red blood cells carry oxygen
- 3 a) white blood cells b) white blood cells help fight disease
- 4 a) platelets b) platelets cause blood to clot during an injury
- 5 Any three of the following: nutrients, waste products, gasses, antibodies, or hormones.

CONCLUSION

Human blood is a complex mixture of cells and liquids whose individual parts perform important functions in our bodies.

What Happened

Review the section with students. Emphasize bold-face words that identify key concepts and introduce new vocabulary.

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What We Learned

Answers will vary. Suggested responses are shown at left.

Conclusion

Read this section aloud to summarize the concepts learned in this activity.

Assessment

Details on various assessment methods can be found in the Teacher Binder.

In addition, you may also wish to use the Black Line master on the back of this page for a simple 10-point quiz.

Answer Key:

- 1) T 2) T 3) F 4) F 5) T
6) a 7) b 8) c 9) d 10) b

Extended Teaching

1. Invite an American Red Cross representative to visit your classroom. Discuss the need for blood donations, and the different ways blood is processed and used.
2. Have students research HIV (the virus that causes AIDS), Hepatitis B, and similar blood-borne pathogens. Discuss the safety precautions that health workers take and why they are needed.
3. Arrange a visit to a hospital or medical laboratory. Talk with technicians about how and why blood testing is done.
4. Have students research human blood types. If possible, have each student discover his/her own blood type. Compare the blood types of students with blood types in the general population.
5. Invite a EMT or similar medical professional to visit your classroom. Talk about first aid and ways of stopping blood flow in an emergency.

NAME _____ DATE _____

BEADS OF BLOOD



True/False (Circle T for true, F for false.)

- T F 1.** The major portion of your blood is liquid, primarily water.
- T F 2.** The liquid part of your blood is called plasma.
- T F 3.** Dissolved nutrients are carried in the platelets.
- T F 4.** Your blood can only carry liquids, not gasses.
- T F 5.** Plasma can help warm or cool various parts of your body.

Multiple Choice (Fill in the circle beside the best answer.)

- 6.** Scientists call the red blood cells that carry oxygen in the blood . . .
- a. erythrocytes
 - b. leukocytes
 - c. platelets
 - d. hormones
- 7.** Scientists call the white blood cells whose purpose is to fight disease . . .
- a. erythrocytes
 - b. leukocytes
 - c. platelets
 - d. hormones
- 8.** Scientists call the special cells which help clot your blood when you're cut . . .
- a. erythrocytes
 - b. leukocytes
 - c. platelets
 - d. hormones
- 9.** Which of the following is not a function of blood?
- a. to carry away waste products
 - b. to help fight disease
 - c. to transport gasses like oxygen and carbon dioxide
 - d. to digest food
- 10.** Scientists call the disease fighting chemicals in blood . . .
- a. hormones
 - b. antibodies
 - c. erythrocytes
 - d. leukocytes