

Move to the Beat

Lesson Four: Students will learn how much blood is pumped throughout the body every minute.

MATERIALS:

1. 2 dishpans or other plastic containers
2. Quart container
3. Water
4. 1/4 c. measuring cup
5. Timer
6. Copy of center directions & recording sheet

SETUP:

Begin this lesson by sharing the heart model with students. Guide them to help you locate the heart's four chambers (numbered parts: 1=right atrium; 5=right ventricle; 15=left ventricle; and 28=left atrium). Point out that the adult heart pumps about five quarts of blood each minute through the chambers and out to the body. Demonstrate this amount by using the quart container to fill up one dishpan with five quarts of water.

Next, dip the 1/4 c. measuring cup in the water. As you slowly pour the water back into the dishpan, explain that the heart pumps a little more than two ounces of blood, or about 1/4 c., with each heartbeat. Announce you are going to challenge students to mimic the heart's hard work by trying to move the water in the dishpan into an empty dishpan in one minute or less using only the measuring cup.

Assign a job to each of three students:

1. The timekeeper will start the timer for one minute and announce when time is up.
2. The pumper will use the measuring cup to transfer the water.
3. The counter counts the number of scoops (heartbeats).

At the end of the simulation, ask the pumper if he or she had to work hard during the challenge. Then ask if students think they could continue the simulation for 24 hours without getting tired. Share that, at the rate of five quarts per minute, the heart pumps approximately 2,000 gallons (or 8,000 quarts) of blood each day! Students will quickly realize the heart is one hardworking muscle.

To give all students a shot at the heartbeat challenge, place the materials at a center, along with a copy of the center directions and recording sheet. Let groups of three students try the challenge during free time.



EXTEND WITH STEM

- Doctors use a stethoscope to listen to the hearts of their patients. Challenge your students to use household items to make their own stethoscopes. Provide small groups of students with plastic tubing, funnels of different sizes, duct tape, balloons, cardboard tubes, modeling clay, and scissors. Provide time for each group to share its best design.
- The hardworking heart needs to stay healthy so it can pump blood nonstop all day, every day. One way to do this is by making physical activity a part of your day. Direct students to pretend that a week of bad weather is keeping the class indoors. The school gym is closed for repairs, so students must find a way to stay physically active while in the classroom. Have each group come up with a plan for adding 20 minutes of fun physical activity into an average classroom day. Provide time for each group to share its plan. Select one or more ideas to try.

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Center Directions

FOR GROUPS OF 3 STUDENTS EACH:

1. Each group member selects a job: timekeeper, counter, or pumper.
2. The pumper fills one of the dishpans with five quarts of water.
3. The timekeeper announces the start of one minute and sets the timer.
4. The pumper uses the measuring cup to transfer water from the full dishpan to the empty dishpan. The counter counts the numbers of scoops that are transferred.
5. The timekeeper announces the end of one minute, and the pumper stops scooping water.
6. The timekeeper completes the recording sheet for group.

One Amazing Muscle

The heart pumps five quarts of blood each minute throughout the body. This equals about 2,000 gallons per day. That means your heart will pump about 730,000 gallons of blood in one year!



Recording Sheet

STUDENT GROUP	# OF SCOOPS	DID YOU EMPTY THE DISHPAN? (CIRCLE ONE)	
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No
		Yes	No