(Music)

Student 1: Where are we going?

Student 2: To see the giant heart.

Student 2: We’re supposed to learn how blood flows through the heart so we are going to see the Franklin Institute’s two-story heart.

Student 2: The heart is a muscle inside our chest that pushes blood around. It’s part of the circulatory system. You can see different animals have different sized hearts.

Student 2: I’m going to record this so if you have any questions tell me to hit the button.

Student 1: Okay, let’s go.

(sound of a heart beat)

Student 1: So, we’re really going to follow the path blood flows through the heart?

Student 2: Yup.

Joan Cartan-Hansen, Host: WELCOME TO YOUR HEART. YOU ARE NOW ENTERING THE RIGHT ATRIUM.

(heart beat)

Student 2: Atrium? Electrical system? Wait, hit the button. I need more information.

Cartan-Hansen: YOUR HEART IS IN THE MIDDLE OF YOUR CHEST.

IT’S ABOUT THE SIZE OF YOUR FIST AND WEIGHS ABOUT 10 OUNCES--ABOUT AS MUCH AS ONE OF YOUR SNEAKERS.

IT’S MADE UP OF SPECIAL TISSUE KNOWN AS CARDIAC MUSCLE.

THE HEART IS ONE OF THE STRONGEST MUSCLES IN YOUR BODY.

IT’S NOT HEART SHAPED.

ITS MORE LIKE AN UPSIDE-DOWN PEAR.

MUSCLE TISSUE FORMS FOUR CHAMBERS WITH A DIVIDING WALL CALLED THE SEPTUM.

IN THE RIGHT TOP CHAMBER OR ATRIUM, BLOOD FLOWS IN FROM THE BODY.

THE HEART BEATS, WHICH IS TO SAY THERE IS AN ELECTRICAL SIGNAL THAT CAUSES THE CARDIAC MUSCLES TO CONTRACT AND SQUEEZES THE BLOOD THROUGH A ONE-WAY VALVE INTO THE RIGHT VENTRICLE.

Student 2: Okay, here we are in the right ventricle. Man, look at the thick walls of tissue.

Student 1: Yeah, look down, we’re high up. What happens now?

Student 2: Now, I think the blood goes into the lungs.

Cartan-Hansen: FROM THE RIGHT VENTRICLE, BLOOD GOES THROUGH THE PULMONARY ARTERIES INTO THE LUNGS.

THE LUNGS HAVE HUNDREDS OF MILLIONS OF AIR SACKS CALLED ALVEOLI.

THE OXYGEN WE BREATHE PASSES IN THROUGH THE WALLS OF THESE AIR SACKS AND INTO THE BLOOD STREAM.

RED BLOOD CELLS CAPTURE THE OXYGEN AND CARBON DIOXIDE IN THE BLOOD GOES OUT INTO THE AIR SACKS AND WE EXHALE IT.

THE OXYGEN RICH BLOOD THEN RETURNS TO THE HEART INTO THE LEFT ATRIUM

Student 1: okay, here we are at the left atrium. Man, look at the septum.

Student 2: Yeah, I guess we’re now going, I mean blood is going into the left ventricle. What happens here?

Cartan-Hansen: THE VERY MUSCULAR LEFT VENTRICLE PUMPS BLOOD OUT INTO THE REST OF THE BODY.

WITH A GREAT FORCE, THE BLOOD MOVES INTO THE AORTA, A TYPE OF BLOOD VESSEL CALLED AN ARTERY.

ARTERIES MOVE BLOOD INTO TINY VESSELS CALLED CAPILLARIES WHICH ARE FOUND THROUGHOUT YOUR WHOLE BODY.

BLOOD CELLS DROP OFF OXYGEN AND FUEL AND PICK UP CARBON DIOXIDE AND WASTE PRODUCTS.

THE BLOOD THEN HEADS BACK TO THE HEART.

THERE IT ENTERS THE RIGHT ATRIUM AND THE PROCESS STARTS OVER AGAIN.

YOUR HEART BEATS OR PUMPS BLOOD SOME ONE HUNDRED THOUSAND TIMES A DAY.

IF YOU START EXERCISING, YOUR BRAIN TELLS YOUR HEART TO PUMP FASTER TO GET MORE OXYGEN TO YOUR MUSCLES.

YOU CAN FEEL YOUR HEART BEATING AND CALCULATE YOUR PULSE, OR THE NUMBER OF TIMES PER MINUTE YOUR HEART BEATS.

MEDICAL PROFESSIONALS ALSO TEST YOUR BLOOD PRESSURE.

BLOOD PRESSURE IS THE MEASURE OF HOW HARD BLOOD IS PUSHING AGAINST THE WALLS OF YOUR ARTERIES.

BY LOOKING AT YOUR PULSE AND YOUR BLOOD PRESSURES, DOCTORS CAN TELL A LOT ABOUT HOW YOUR HEART IS DOING.

TO KEEP YOUR HEART HEALTHY, YOU NEED TO EXERCISE, EAT GOOD FOOD AND GET LOTS OF SLEEP.

Student 1: Well, that’s it. We’ve gone through the heart.

Student 2: fascinating.

Student 1: You know, your heart is a pretty amazing. Want to go through again?

Student 2: Sure THING!

Cartan-Hansen: TO LEARN MORE ABOUT THE HEART AND LOTS OF OTHER SCIENTIFIC TOPICS, CHECK OUT THE SCIENCE TREK WEBSITE.

YOU’LL FIND IT AT IDAHOPTV.ORG/SCIENCETREK.

(music)

Narrator: Presentation of Science Trek on Idaho Public Television is made possible through the generous support of the Laura Moore Cunningham Foundation, committed to fulfilling the Moore and Bettis Family legacy of building the great state of Idaho; by the Idaho National Laboratory, mentoring talent and finding solutions for energy and security challenges; BY WALMART AND THE WALMART FOUNDATION, INCREASING ACCESS FOR IDAHO’S CHILDREN TO EXPLORE THE POSSIBILITIES OF SCIENCE AND TECHNOLOGY AND SPARKING THEIR INTEREST IN CAREERS THAT SHAPE OUR WORLD; by the Friends of Idaho Public Television; by the Corporation for Public Broadcasting AND BY VIEWERS LIKE YOU, THANK YOU.