Lesson Name: Can you feel your heartbeat?
Presenter(s): Jenny Chang & Soomin Jung
Grade Level: 1st

CA Science Standards Connections: 1st Grade, Life Science
1-LS-2. Plants and animals meet their needs in different ways. As a basis for understanding this concept:
   b. Students know both plants and animals need water, animals need food, and plants need light.

Next Generation Science Standards Connections: 4th Grade, Life Science
4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

<table>
<thead>
<tr>
<th>Science &amp; Engineering Practices</th>
<th>Disciplinary Core Ideas</th>
<th>Crosscutting Concepts</th>
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| Analyzing and Interpreting Data | LS1.A: Structure and Function
   Analyzing data in K-2 builds on prior experiences and progresses to collecting, recording, and sharing observations. Use observations (firsthand or from media) to describe patterns in the natural world in order to answer scientific questions. (K-LS1-1) | Cause and Effect
   Simple tests can be designed to gather evidence to support or refute student ideas about causes. (K-PS2-1),(K-PS2-2) |
| Developing and Using Models | PS2.A: Forces and Motion
   Modeling in K-2 builds on prior experiences and progresses to include using and developing models (i.e., diagram, drawing, physical replica, diorama, dramatization, or storyboard) that represent concrete events or design solutions. Develop a simple model based on evidence to represent a proposed object or tool. (K-2-ETS1-2) | |
| Analyzing and Interpreting Data | PS2.B: Types of Interactions
   Analyzing data in K-2 builds on prior experiences and progresses | |

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to collecting, recording, and sharing observations. Analyze data from tests of an object or tool to determine if it works as intended. (K-2-ETS1-3)

**Common Core Standards:**

*ELA/Literacy:*

W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

*Mathematics:*

MP.2 Reason abstractly and quantitatively.

**Teaser:**

Have you thought about how nutrients that we eat move around throughout our body to provide energy to every place of our body, including our toes? One of the organs in our body that is essential in keeping us alive is the heart. Heart is an organ that helps to circulate blood throughout our bodies so that we can breathe, walk, eat, run, and study! We are very excited to be here with such brilliant scholars so that we can explore this part of science together!

**Objective:** As a result of your lesson, what will students learn? What will they be able to do?

*Introduced to the concept of structural form and function*

*Respiratory and circulatory system basics*

Plants and animals meet their needs in different ways

*Plants and animals both have a need for water. Animals need food, and plants need light.*

*Why do animals need water?*

**Vocabulary/Definitions:** 3 – 6 important (new) words

- **Heart:** a muscular organ that pumps blood throughout the blood vessels in all parts of the body in rhythm
- **Heart chambers (right & left atrium, right & left ventricle)**
- **Blood vessels:** “tubes” that help to carry the blood throughout the body
- **Artery:** takes oxygenated (“fresh”) blood AWAY from the heart
- **Veins:** brings deoxygenated (“used up”) back TO the heart
- **Aorta:** the largest artery in our body
- **Blood:** body fluid that helps to transport oxygen, nutrients, and wastes throughout the body
• Blood cells: Red blood cell, white blood cell, platelets (I think it’ll be hard to define these)
• Water

Materials:
What will you bring with you?
A real heart from Anatomy lab, timer (if needed)
Blood
Tubes with glitter, water, Stethoscope (One for each pair)
Posters

What should students have ready (pencils, paper, scissors)?
science journal, if they have one
Pencils
Clock/watch with second hands

Classroom Set-up:
Student grouping:
We will be working as a classroom. Each student should have a partner next to them for the hands-on activity.

Will require water for lesson. Access to a sink would be helpful.
Set-up time needed: 5 minutes
Clean-up time needed: 5 minutes

Classroom Visit

1. Personal Introduction: 5 Minutes
   Who are you? What do you want to share with students and why? How will you connect this with students’ interests and experiences?
   Soomin & Jenny: Hi, everyone. My name is Soomin and I am a 4th year undergraduate student attending UC Berkeley. Hi! I’m Jenny and I’m also a student just like you at UC Berkeley! How many of you guys know UC Berkeley? I am studying to become a doctor because I love studying about the human body and I want to be able to teach others about the importance of taking care of oneself! I am really excited to spend time with you today because I know that we will have an exciting time together for the next 50 minutes to study and experience science!!! One thing I would like to ask during our time together is
that this classroom be a place where we can respect one another, and I would love to hear what each students/scholars have to say (this is how scientists should behave). So if a boy scholar speaks first, I would like a girl scholar to participate next. Does that sound fair?

**Topic Introduction:** ___10_____ Minutes

What questions will you ask to learn from students? Big Idea(s), vocabulary, assessing prior knowledge...

Today we’re going to learn about the heart and blood. Can you feel your heart beat?


Before we get started, let’s make a chart to start out our scientific journey (draw 3 columns: what we know, want to know, questions - have total of about 4 students participate per column and we can write them down on the board.

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<tr>
<th>What we know</th>
<th>What we want to know</th>
<th>Questions?</th>
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**2. Learning Experience(s):** _20-25____ Minutes

What will you do, what will kids do? Demonstrations, hands-on activities, images, games, discussion, writing, measuring… Describe in order, including instructions to kids.

Demonstration of Blood (Jenny)

- Who’s seen blood? Blood is a liquid and its made up of little things called cells and water! The little cells in blood carry oxygen. The water helps the blood flows though our body. That’s why it’s important to drink water. Without water, blood cannot flow and your body will not get oxygen.

- Demonstration: Glitter, water, tubes
  - Glitter: cells
  - Tubes/clear straws: Blood vessels
  - Hand out tubes with glitter in them. Each pair of students will get one.
Demonstration of heart (Jenny)

- Your heart is really a muscle. It's located a little to the left of the middle of your chest, and it's about the size of your fist. There are lots of muscles all over your body — in your arms, in your legs, in your back, even in your behind.
- Hold up real heart!
- But the heart muscle is special because of what it does. The heart sends blood around your body. The blood provides your body with the oxygen and nutrients it needs. It also carries away waste.
- Your heart is sort of like a pump, or two pumps in one. The right side of your heart receives blood from the body and pumps it to the lungs. The left side of the heart does the exact opposite: It receives blood from the lungs and pumps it out to the body.
- We're going to find our pulse which is the pace that our heart pumps at.

Hands-on activity (Soomin)

- What is a pulse?
- Let's find out pulse. Everyone get two fingers (let's say right hand) and place it gently on your left wrist... can you feel it?
- Team with the person next to you:
  - First person: timer & writer for the chart
  - Second person: active
- We will time our pulses before we start our activity. Count how many pulses you hear for one minute. Soomin will call time. Write it down!
- If we move, do you think our pulses will increase or decrease?
- Have the active student run in place for 60 sec (then 90, and 120 sec), measure for a minute (3 times total)
- Switch!

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<th>Rest</th>
<th>Trial 1 (60 sec)</th>
<th>Trial 2 (90 sec)</th>
<th>Trial 3 (120 sec)</th>
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<tbody>
<tr>
<td>Scholar 1:</td>
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<td>Scholar 2:</td>
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3. **Wrap-up: Sharing Experiences**  ______ 10______ Minutes

*Putting the pieces together – how will students share learning, interpret experience, build vocabulary?*

We can have students share what they see from the chart and what they have learned from the experience

- Did your pulse increase or decrease after running in place?
- Why do you think that is the case?
- If you rest for 10~15 minutes, do you think your pulse will be closer to what you measured in the very beginning?
- Why do you think our pulse rate is not ALL the same (may be similar)?
- Lead into connections & close section

4. **Connections & Close:**  ______ 5______ Minutes

*What else might kids relate this to from their real-life experience? How can they learn more? Thanks and good-bye! Clean-up.*

How can take care of our heart?

- Exercise
- Eat a healthy diet
- Drink lots of water rather than fizzy drinks

**Total 50 - 60 Minutes**

**Follow-up - After Presentation**

*Suggest* students write a letter explaining “How we learned about _____?”

*List or attach* examples of activities, websites, connections for additional learning.

*Attach* worksheets, hand-outs, visuals used in classroom presentation.