6th Grade Activity 8: “Open Heart Inquiry”

Learning goals:
After completing this exercise students should be able to:
• Design and carry out a simple experiment.

Introduction:
In a previous activity, you investigated how exercise affected heart rate. You learned that exercise causes heart rate to increase. Can you think of anything else that might affect heart rate? As a class, brainstorm ideas about what things you think could influence heart rate. Write down a few of the things you think could affect heart rate in the blanks below.

____________________________________

____________________________________

____________________________________

____________________________________

You will work in small groups to design and conduct an experiment to test whether one of these things influences heart rate. Before you begin, review the steps of the scientific process.

Step One:

Step Two:

Step Three:

Step Four:

Step Five:

Step Six:

Step Seven:
Break into small groups of 3-4 students to complete the rest of the activity.

Could you change something about any of these things? Write down the things you could change on sticky notes and place them in the squares below. (You may do an example together as a class).

Next think about what you could measure in your experiment to see if there is a change. Write what you will measure on a sticky note, and place it in the box below.
**Question:** To create your question, choose one thing that you are going to change and place it in the first box below. Place what you are going to measure in the second box.

When we change

, what will happen to

?

**Hypothesis:**
Based on what you know about the heart, what do you think will happen during your experiment?

Remember that a hypothesis is an “educated guess”, a prediction or explanation based on the facts you know. In a complete sentence, state your hypothesis about how you predict what you change will affect what you measure.

**Identifying Variables:**
An important component of designing an experiment is identifying variables. The *independent variable* is the thing that we will change in our experiment. The *dependent variable* is the thing that we will measure. What are the independent and dependent variables in this experiment?
Independent variable:

We will change

Dependent variable:

We will measure

Experimental Design:

Before and After: In order to do your experiment, you will need to compare what happens when you change your variable to what happened before you changed it. This means you will have to measure at least twice, once without the change and once with the change.

How Many Times?: Is two times enough? Think about when you did the experiment on heart rate and exercise. You looked at data for the entire class. Did everyone’s results come out the same? How many times will you measure in your experiment?

We will measure with the change and without the change a total of ___________________ times.
Keeping Things Fair: In order to be fair, you can only change one thing in your experiment (your independent variable). Everything else must stay the same. What things will you keep the same in your experiment?

We will keep the same:
Write your experimental procedure by answering the questions below. Have your procedure checked by your teacher before you continue.

1.) This is the type of change we will make. (Be specific):

2.) This is how we will measure our dependent variable:

3.) We will take _________________ measurements of dependent variable before and after the change.

4.) This is what we will do to keep things fair in our experiment:

This experimental design has been approved by the teacher.
**Recording your data:**
Record your measurements in the table below.

<table>
<thead>
<tr>
<th>With the change</th>
<th>Without the change</th>
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Make a graph of your data.
Conclusions:
Look at what happened when you made your change.

What happened to

What we measured

When we changed

What we changed?

Please write your conclusion as a complete sentence: