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Blood Pressure

What affects blood pressure?

BEST FOR GRADES
5-8

ESTIMATED TIME
25-60 Minutes

You Will Need

- ❏ Sphygmomanometer (blood pressure cuff)
- ❏ Stethoscope

  Blood pressure cuffs and stethoscopes can be found online (sometimes in a kit together) inexpensively.
- ❏ Stopwatch or timer
- ❏ A few friends or family members to be test subjects
- ❏ Science-U Blood Pressure Worksheet

NOTE: Kids love to use real medical equipment, but if you prefer not to purchase anything for this experiment, there are several free Blood Pressure mobile apps you can try, though the readings may not be as accurate.

Directions

1. Experiment! Ask your scientist to choose an activity that each test subject will be able to perform. It could be 10 minutes of video games, 1 minute of jumping jacks, or 20 minutes of yoga. . . be creative!
2. Gather a few friends and/or family members to be test subjects. Note their age, gender, and experience with the chosen activity on the worksheet.
3. Ask your scientist to create a testable question:
   - 3.1 Example: Will blood pressure change after playing 10 minutes of an intense video game?
4. Practice using the stethoscope by listening to your own heartbeat. It can be difficult to hear. Try it a few times to familiarize yourself with the "lub-dub" sound you are looking for.
5. Take a baseline blood pressure reading for each person. If using a stethoscope and BP cuff:
   - 5.1 Wrap the blood pressure cuff around your "patient's" arm.
   - 5.2 Place your stethoscope in the crease of their elbow.
   - 5.3 Inflate the blood pressure cuff until you cannot hear any flow of blood. This means the brachial artery is completely closed. (Do not pump it higher than 160 mmHg or you could break the bag inside the cuff.)
   - 5.4 Slowly release the metal pressure gauge until you hear blood flowing "lub-dub" (called the "sounds of Korotkoff"). TThe number you see on the gauge when you hear the blood flow again is the **Systolic Pressure**. Record it on the worksheet.
   - 5.5 Continue to slowly release the valve and wait until you can no longer hear blood flowing. The number you see on the gauge when you can no longer hear blood flowing is the **Diastolic Pressure**. Record it on the worksheet.
   - 5.6 Completely open the valve and deflate the BP cuff.
6. Experiment! Ask your test subject to do the activity you have chosen for the length of time you have chosen. Be sure to time the activity so each participant does the activity for the same amount of time.
7. IMMEDIATELY after the friend stops the activity, take his or her blood pressure. Record it on the worksheet.
8. Repeat the same activity for the same amount of time with each test subject, and record their readings on the worksheet.
9. Analyze the results! Report your conclusions!

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Blood Pressure

Discovery Questions & Keywords

Discovery Questions

Beginning the Experiment

I can't see or feel my blood pressure, so why does it matter?

How do I know if my blood pressure is healthy?

During the Experiment

Why did we take a baseline reading?

After the Experiment

Take a look at your test subjects. Did the numbers in males differ from females? Were your friends who regularly do this activity more or less affected? Did age factor in to your test subjects' reactions?

Keywords

Blood Pressure

A measure of how hard the heart has to pump to move the blood through your body.

Systolic Pressure

The force of the blood on the blood vessels when the heart beats.

Diastolic Pressure

The force of the blood on the blood vessels between heart beats.

Veins

Blood vessels that carry the blood back to the heart.

Arteries

Blood vessels that carry blood away from the heart.

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Blood Pressure
Experiment Worksheet

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Activity: _____

Test subject data:

Person 1: Name _____ Age:_____ Gender: _____
Experience level (with the chosen activity):
- ❑ No experience
- ❑ A little experience
- ❑ Experienced
- ❑ Expert

Person 2: Name _____ Age:_____ Gender: _____
Experience level (with the chosen activity):
- ❑ No experience
- ❑ A little experience
- ❑ Experienced
- ❑ Expert

Person 3: Name _____ Age:_____ Gender: _____
Experience level (with the chosen activity):
- ❑ No experience
- ❑ A little experience
- ❑ Experienced
- ❑ Expert

Person 4: Name _____ Age:_____ Gender: _____
Experience level (with the chosen activity):
- ❑ No experience
- ❑ A little experience
- ❑ Experienced
- ❑ Expert

Person 5: Name _____ Age:_____ Gender: _____
Experience level (with the chosen activity):
- ❑ No experience
- ❑ A little experience
- ❑ Experienced
- ❑ Expert

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Blood Pressure

Blood Pressure Readings & Analysis

Blood pressure readings:

	Person 1	Person 2	Person 3	Person 4	Person 5
Baseline Blood Pressure	Systolic				
	Diastolic				
Post-activity Blood Pressure	Systolic				
	Diastolic				

Results analysis:

(Did blood pressure change? Did you notice any trends? Did the age or gender of the participant impact the results? Did prior experience with the activity impact the results?)

Conclusion:

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Blood Pressure

The science of a how blood pressure works.

How does blood pressure work?

Blood pressure is a measure of how hard the heart has to pump to move the blood through your body. The pressure in your blood vessels rises and falls as the heart beats. The highest pressure is called the systolic pressure, and is the force of the blood on the vessels when the heart beats. The lowest pressure is called the diastolic pressure, and it occurs when the heart rests between beats. As the blood travels further and further away from the heart, the pressure decreases.

Veins have the lowest pressure of all of the blood vessels in the body, since they are carrying blood back towards the heart. The arteries are the large blood vessels that carry blood from the heart to all the organs and muscles of the body to give them the energy and oxygen they need.

Blood pressure can be affected by stress, exercise, and relaxation. When blood pressure is high, the heart is working extra hard to pump blood through the body. Blood pressure comes down when we relax. Even simply taking calm, deep breaths for several minutes can lower blood pressure.

Interested in learning more about keeping your heart healthy? The American Heart Association provides *Keeping Your Heart Healthy Through Life's Simple 7 - for Kids.* (http://bit.ly/1Mhbgjw)

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Blood Pressure

Discovery question answer key for parents and teachers.

Beginning the Experiment

I can't see or feel my blood pressure, so why does it matter?

> *Your doctor checks your blood pressure during every appointment to ensure your heart is healthy. Blood pressure that is too high or too low can indicate health problems.*

How do I know if my blood pressure is healthy?

> *Healthy blood pressure in children and adolescents depends on age, gender, and height. Talk with your pediatrician to find out the best number for you.*

During the Experiment

Why did we take a baseline reading?

> *A baseline measure is taken before a change occurs. This way, you can determine how much blood pressure changes as a result of the activity you ask the test subjects to perform.*

After the Experiment

Take a look at your test subjects. Did the numbers in males differ from females? Were your friends who regularly do this activity more or less affected? Did age factor in to your test subjects' reactions?

> *Experiment! The more people you include in your experiment, the more insightful your data and conclusions will be.*

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