

# Pulse and Blood Pressure

## Teacher Information

### Time Allowance

50 minutes

### Background Information

Reading of vital signs, such as pulse and blood pressure, provides important immediate data on a person's health. In the treatment of patients in emergencies, vital signs are indispensable data. Also, vital signs provide important immediate data on the state of vascular fitness and overall physical health. Many jobs require employees to be physically fit. This is especially true for astronauts because of the stresses of liftoff, reentry and working in a low gravity environment.

The pulse rate is stated as a ratio of palpable (reported by sense of touch) beats in the carotid artery or distal radial artery per minute. If the pulse is absent after palpating for nine seconds, then the patient is clinically dead and CPR must be started to keep the brain and the rest of the body from biological death. If the pulse rate is above 100 for an adult, this condition is referred to as tachycardia or "fast heart." When the pulse is below 60, it is called bradycardia or "slow heart." Many athletes' hearts pump blood so efficiently that their pulse rates may be below 60.

Blood pressure is measured by means of auscultation (listening.) Sounds of blood flow are heard through a stethoscope placed on the artery while a constricting cuff gradually releases. The pressure in the cuff is visually reported in mm of mercury at two intervals: when the sounds are first heard and when sounds can no longer be heard. These two values are, respectively, systolic (when the heart is pumping) and diastolic (between pumping.) Blood pressure readings indicate the pressure that is exerted by the blood upon the wall of the vessels, especially the arteries. Knowing these values can be useful diagnosing shock or illness.

### Materials (per pair of students)

stethoscope  
blood pressure cuff  
alcohol swabs  
clock with second hand

### Procedure – Part I

1. Assign students to pairs.
2. Instruct them to use alcohol swabs to clean the earpieces of the stethoscopes between each use..
3. Discuss background information.

4. Discuss safety procedures, including proper placement of blood pressure cuff, only leaving the cuff on for less than 3 minutes and not tapping on the stethoscope.

### **Reflection and Discussion**

1. What happens to your heart rate when you are afraid? Relaxed? Stressed?
2. Could everyone find her partner's distal and radial pulse?
3. How do you think living in space affects the heart rate?
4. Why do you think that thigh blood pressure might be dangerous.
5. Can you think of ways that a person might try to lower their blood pressure or pulse rate?
6. What other human systems need to be monitored on a regular basis?

## Reaction Time Lab (Part I)

TITLE:

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PURPOSE:

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HYPOTHESIS:

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PROCEDURE:

1. Ask your partner to be seated and rest his arm on lab table with his dominant hand extending over the edge of the table.
2. Ask your partner to hold his hand as if grabbing a glass, leaving an opening of 4 to 5 cm between his fingers and thumb.
3. Stand by your partner and vertically hold a meter stick so that the 0 edge of the meter stick is positioned just above the open hand.
4. Instruct the subject to catch the stick as soon as he sees it falling.
5. Release the meter stick so that the stick will drop through your partner's fingers.  
**Do not signal when the stick will drop.**
6. Read and record the number just above your partner's fingers or thumb.
7. Repeat steps 1-6 ten times, then average the results to get your partner's average reaction rate.
8. Exchange places with your partner and repeat steps 1-7 of the procedure.

Results:

Name:		Name:	
Trial #1		Trial #1	
Trial #2		Trial #2	
Trial #3		Trial #3	
Trial #4		Trial #4	
Trial #5		Trial #5	
Trial #6		Trial #6	
Trial #7		Trial #7	
Trial #8		Trial #8	
Trial #9		Trial #9	
Trial #10		Trial #10	
<b>Average</b>		<b>Average</b>	