



Monitoring EKG

Teacher Notes

BIOLOGY
Human
Physiology

Driving Question:

Can you visualize electrical activity of the heart?

Applied Technology: Data-logging

Student Level: High School Level (14-18)

Duration: 1 lesson period

Recommended settings: Student Investigations

Learning Objectives

- To use the EKG sensor to monitor electrocardiogram.
- To study the meaning of P, Q, R, S, and T waveforms and associate these wave forms with activity of the heart.
- Determine the heart rate by determining the rate of individual wave forms in the EKG.
- To investigate EKG changes with mild stimulants.

Didactical approach

In this activity students use EKG sensor to record the electrical activity of the heart and investigate the recorded EKG pattern.

Concepts learnt in this activity:

- Electrocardiogram, P, QRS and T waveforms, heart activity.

Materials

In your investigations you will use:

- Interface or data-logger e.g. CMA VinciLab,
- EKG sensor,
- Electrode patches (delivered with the sensor).

Procedure

- Let the students set up the experiment.
- Start the Coach program and open Coach Activity 'Monitoring EKG'.
- Let the test subject sit in a chair, with their arm laying at their side or on a table in front of him, when data are being collected.

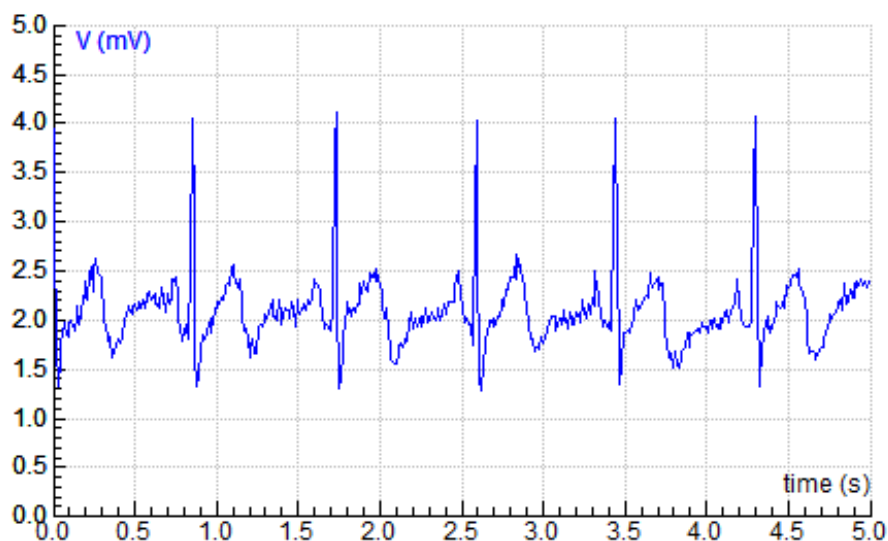
- The test subject's skin should be clean at areas where electrodes are placed.
- The test subject should remain calm and relaxed, and should not watch the data-logger or computer screen.
- Let students perform the investigations.

Questions and Assignments

- How do the different waveforms associate with the different heart activities?
- Why do you think it is important to look at time intervals of the different waveforms of the EKG pattern?
- How does an EKG pattern of a resting person differ from an EKG pattern of a person exercising before the test?
- What is the influence of mild stimulants on the EKG pattern?
- Which method do you use to calculate the heart rate?

Data Analysis

The graph below shows a typical EKG pattern recorded with the EKG sensor (CMA EKG sensor 0628i).



Students will find that not all EKGs look the same. Individual differences, waveform amplitudes and shapes, may vary from student to student. In some cases a 50Hz noise can be found within a measurement. Noise may indicate loose attachment of the electrodes or interference with other electrical devices.

Resources

Coach Activity: Monitoring EKG.cma7

Coach Result: Monitoring EKG.cmr7

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