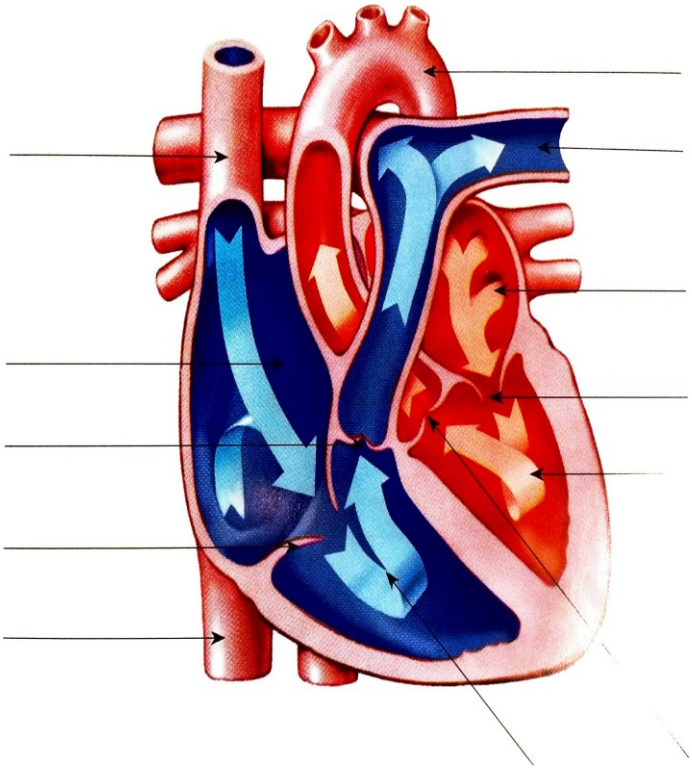
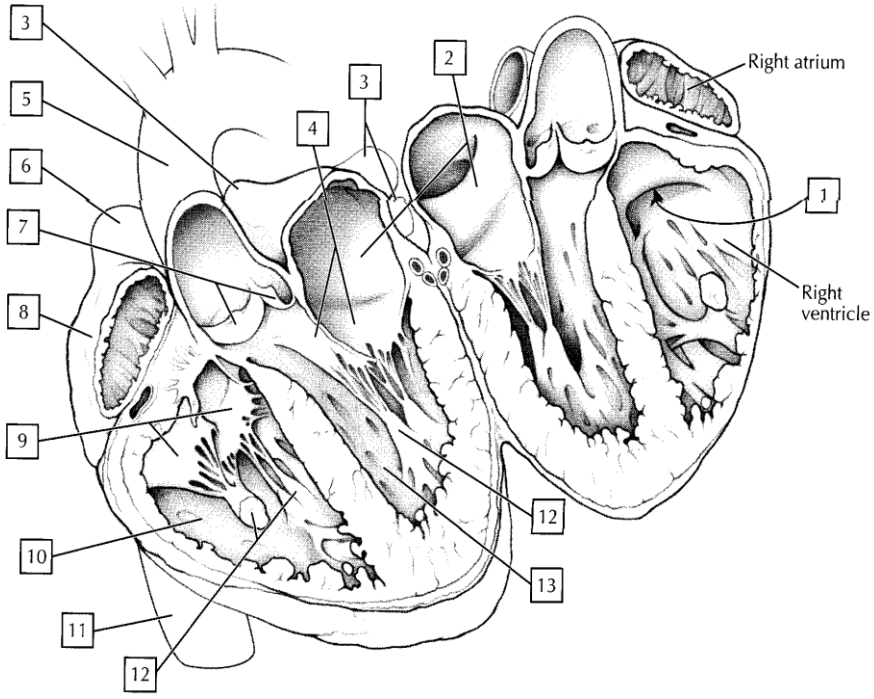
WORKSHEET: CIRCULATORY SYSTEM

Task 1: Watch this video and link the names to the various parts of the heart



- *vena cava inferior (inferior vena cava)*
- *vena cava superior (superior vena cava)*
- *atrium dextrum (right atrium)*
- *valva trunci pulmonalis (pulmonic semilunar valve)*
- *valva tricuspidalis (tricuspid valve)*
- *aorta*
- *truncus pulmonalis (pulmonary trunk)*
- *atrium sinistrum (left atrium)*
- *valva bicuspidalis (bicuspid valve)*
- *valva aortae (aortic seminular valve)*
- *ventriculus sinister (left ventricle)*
- *ventriculus dexter (right ventricle)*

Task 2: Colour/mark the tricuspid valve - blue, bicuspid valve - red, pulmonic valve dark - green, aortic valve - yellow and right atrium - orange, right ventricle - brown, left atrium - light green, left ventricle - purple.



Task 3: Watch this video about specialized conducting myocardium and colour/mark:

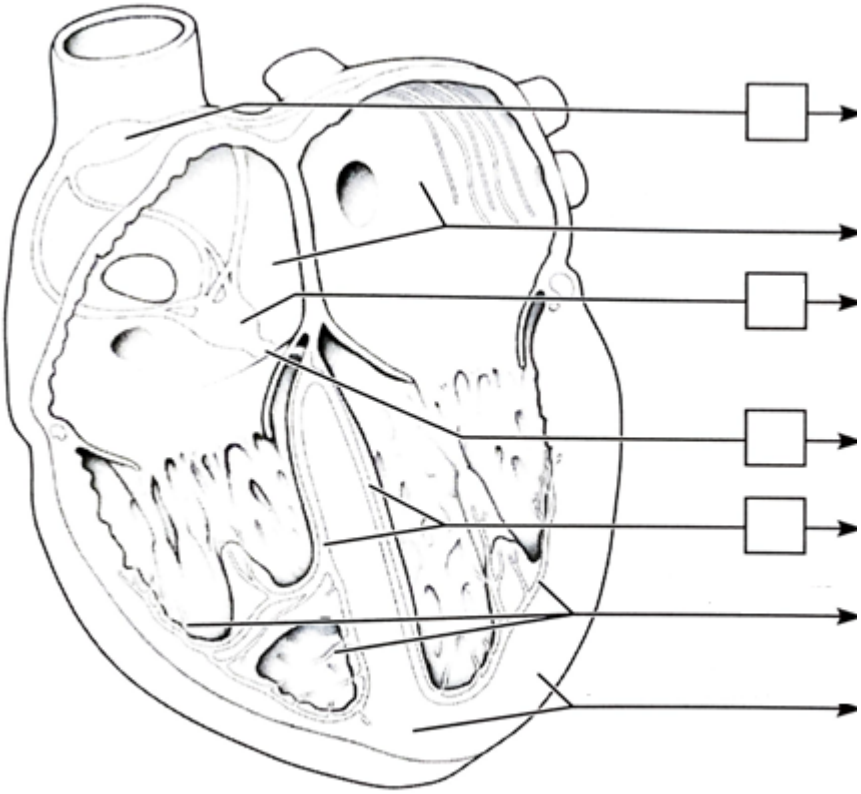
1. SA node – blue

2. AV node – yellow

3. AV bundle (of His) – red

4. R and L branches of bundle of His - purple

5. Subendocardial Purkinje fibers – green



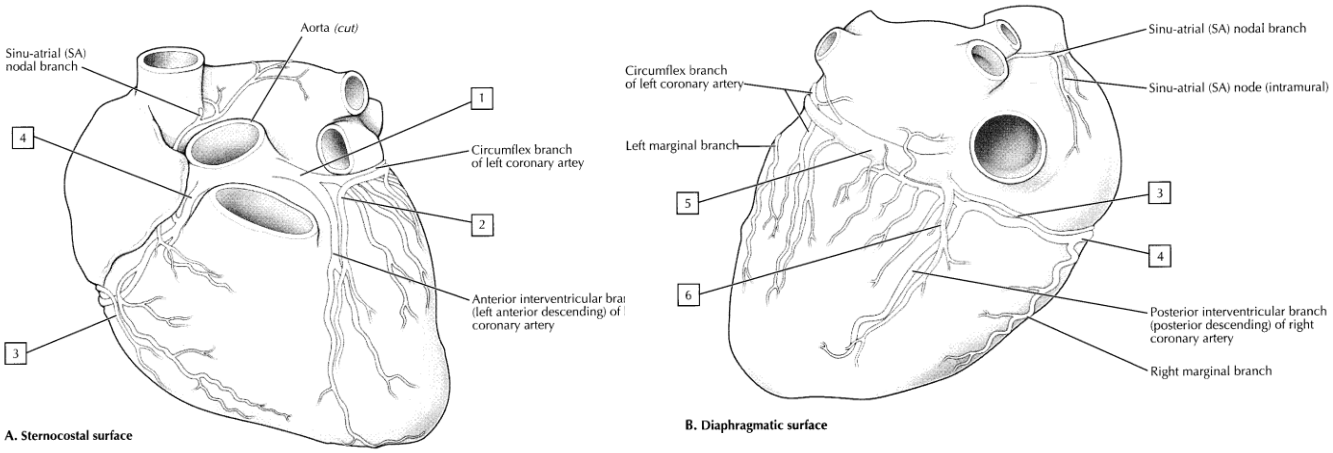
Read the text bellow and then connect the name of the part of conduction system with the correct definition:

The specialized conducting myocardium does not contract but does spread the wave of depolarization rapidly throughout the chambres of the heart. Impulses are initiated in the sinu-atrial (SA) node and are conveyed to the atrioventricular (AV) node. From here, the impulses pass through the common AV bundle (of His) and then spread through the ventricles via the right and left bundle branches and Purkinje fiber system.

SA node	*Node that receives impulses from SA node and conveys them to the common AV bundle (of His)*
AV node	*Right and left bundles that convey impulses down either side of IVS to subendocardial Purkinje system*
Bundle branches	*Pacemaker of heart; site where action potential is initiated*

Task 4: Coronary arteries, cardiac veins and coronary sinus

- connect the correct names to the numbers 1-6.



- **left coronary artery and its major branches**
- **coronary sinus**
- **right coronary artery and its major branches**
- **small cardiac vein**
- **great cardiac vein**
- **middle cardiac vein**

Task 5: Virtual iTee

5.1 Download the Curioscope Virtuali Tee from google play.

5.2 Open the app and scan this picture.

5.3 Name the parts of the vascular system. The table with the concepts below the picture might help you.

Click on the symbol to find out as much information as possible about what is happening inside the vessel.

Click on the symbol to examine the inner structure of the heart.

AORTA	**SUPERIOR VENA CAVA**	**FEMORAL VEIN**	**FEMORAL ARTERY**
VENTRICLES	**PULMONARY VEIN**		
APEX	**CORONARY ARTERY**	**PULMONARY ARTERY**	**ATRIA**

Task 6: Heart rate – choose a correct option (*worlds in italics*)

Children tend to have the heart rate *faster/slower*. It is about 130 beats per minute for *newborns/12* then it gradually drops to the age of *newborns/12*, when it approximates to that of adulthood. In the pre-pubertal and pubertal period, the number of heart beats *reduces/increases* again, probably in the context of more *intense/no nintense* metabolism. In adulthood, the number of heart beats depends on the size of the body (smaller people tend to have *slower/faster*), the training (slower heartbeat at *rest/action*) and mainly on the predominance of suppressive or stimulating effects of the vegetative nerve. **Sympathetic fibres** *speed up/slow down***, parasympathetic fibres** *speed up/slow down* **heart activity. In adulthood, the heart rate is at rest (write ->)…… .**

Task 7: Try to measure your heart rate in different body position

Tools: an assisting person, stopwatch

Procedure:

a) **an assisting person should find good spot** (wrist under the thumb/neck) **to feel your heartbeat before actually measuring it**
b) **in each position measure you heartbeat for 30 secs and multiply it by 2 to you get your approximate heart rate per minute**
c) **repeat the process in positions 1-4 listed below**

1) The examined person is seated for a few minutes, setting a resting heart rate: ……..

2) After that, the examined person stands up and after half a minute we measure the heart rate: ……..

3) After that, the examined person lies down and after a half minute we measure the heart rate: …….

4) The examined person stands up and, after 30 seconds, he / she performs a forward bend and we measure the heart rate:…….

Results - Describe the changes in heart rate and explain their occurrence:

……

……

……

Task 8: Measurement the of fitness index, Step–up test

Tools: an assisting person, stopwatch, a chair/something stable you can step onto and is higher than 40cm
Tips: Ask the assisting person to find the good spot for measuring your heart rate before you do this test, so when the person has to measure your heart rate you don't waste the time and affect your results. You can try measuring your heart rate with smart watch or sports tester if you have it available. You can also try using a smartphone application, BUT they are little tricky as measurement is not always precise and very little movements of your finger can cause resetting the measuring procedure which could lead to little bit incorrect results.

Procedure:

1. Stand up with one foot on the chair, the other stays on the ground, on starting signal, start stepping regularly – up with the other leg, down with the one that was previousely up, back up with the same leg and down with the other leg and so on (E.g.: starting right up, left down -> beep -> left up -> right down -> right up -> left down -> left up and so on...). The rythm of stepping should me 30 steps per minute (use a metronome). The person goes out as long as possible (not longer than 5 minutes).
2. Immediately after finishing, sit down and the assisting person measures your heart rate in three periods:

   1. after 1 min of sitting:……..

   2. after 2 min of sitting:……..

   3. after 3 min of sitting:……..

Calculating the fitness index: $\mathbf{I} = \frac{\text{length of exercise in seconds}}{\text{a total of 3 heart rates}} \text{ X } 100$

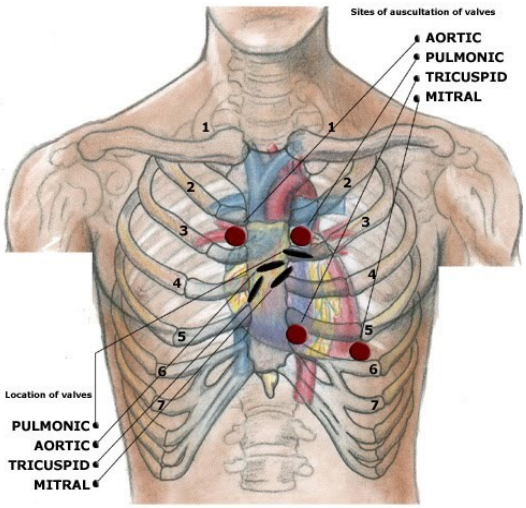
Ratings:		
	I = 80 and less	low performance
	I = 81 – 100	average performance
	I = 101 – 120	good performance
	I = 121 – 140	very good performance
	I = above 140	excellent performance

<u>Evaluate your fitness status based on the results of this test:</u>

Task 9: Listening of heart activity

Projection of heart echoes:

A) **Describe the location of the individual echoes on the surface of chest and their names:**



A:……

P:……

T:……

M……

B) **Connect the correct name of the action in the heart**:

Systolic echoe	*closure of semilunar valves - in the aorta and pulmonary artery*
Diastolic echoe	*closure of the triple and double valve between the atria (atriums) and the ventricles of the heart*

C) **Anagram – try to riddle 4 right words and fill in the text**

In a healthy person, the echoes are ……..…… and without……

Heart and circulatory defects can cause the heartbeat……,

in other words…… or other sounds and murmurs can be heard.

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D) **Watch this video about the sounds of the heart and answer following questions:**

1. **Describe what causes the phases S_1 and S_2:**
2. **Terms "Systole" and "Diastole" are mentioned in the video. When does each occur and which one is longer?**
3. **What are the characteristics of the heart murmurs?**

Task 10: Blood pressure measurement

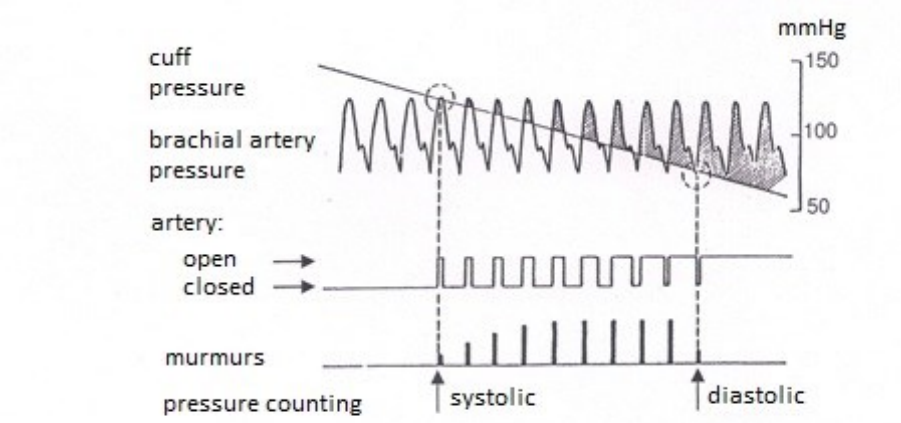

Figure 15 - Illustration of the principle of indirect blood pressure measurement

A) Fill in the missing words.

Blood pressure is not ..... . Normal ..... pressure values are ... - 140 mm Hg. Younger people have generally ..... pressure than the elderly. For ....., systolic pressure is higher than for ..... . The diastolic pressure is .. - 90 mm Hg. When the systolic pressure goes above 160 we talk about .....

When the person exercises the blood pressure goes ....., but it should get back to normal within ..... It it doesn't we should get the ..... as soon as possible.

Words to be used: 4 minutes, women, medical check, moderate hypertension, up, systolic, 70, lower, constant, 100, men

Category	*systolic pressure*	*diastolic pressure*
Optimal	< 120	< 80
Normal	120–129	80–84
High normal	130–139	85–89
Hypertension		
Grade 1 HTN - mild	140–159	90–99
Grade 2 HTN - moderate	160–179	100–109
Grade 3 HTN - severe	≥ 180	≥ 110
Isolated systolic hypertension	≥ 140	< 90

Chart 5 - Definition and classification of individual categories of blood pressure in adults according to the Recommendation of the European Society of Hypertension and the European Society of Cardiology for the Detection and Treatment of Arterial Hypertension in the General Practitioners' (2013); values are given in mmHg. If the systolic and diastolic pressure values of the same person's fall into different categories, we will transfer the person to the higher category.