

What can I learn about the field of my side vision for the sake of choice of my future career

Objective of the module: Gain understanding of the compliance of the anatomy of sensory organs to their functions by performing an experiment on the measuring of the field of peripheral vision.

Learning outcomes of the module:

1. Analyses information about vision.
2. Tells about central and peripheral vision
3. By cooperating in a group, proposes an assumption of an experiment
4. Measures the field of side or peripheral vision
5. Analyses and evaluates the obtained results
6. Draws conclusions

Lessons 1-2

These worksheets belong to: _____

Description of the situation

One of the preconditions of clear vision is that the image of the viewed object falls straight on the central part of retina. It is ensured by the optical system of the eye (cornea, fluid in the anterior chamber, lens, vitreous body). The light rays that enter the eye from the distant objects are almost parallel, therefore in order to focus them on the retina a readjustment of smaller scale is necessary, however, when viewing closer objects, readjustment of larger scale is necessary.

The central area of retina is responsible for the central vision or visual acuity. It is necessary for such professions that require reading, concentrating vision on the text, documents, for computer specialists, sewers, vehicle drivers and representatives of other professions that require detailed vision to carry out their work. If central vision is damaged, a person loses these abilities but does not become completely blind since the peripheral or side vision remains.

With the help of side vision we see objects that are outside the axis of central vision. This type of vision does not provide as sharp acuity as the central vision, nonetheless it is necessary to orient oneself in the space. We also use peripheral vision to orient during twilight and at night since then central vision almost does not function. The peripheral vision is characterized by the field of vision.

Each eye simultaneously catches light from a particular space, called the field of vision. The field of vision can also be described as space that is caught by a fixed eye. An average field of vision is approximately 90° to the sides (lateral) and 60° from the nose (median). If the left arm is stretched sideways, then looking straight it would only be seen with the left eye. The

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field of vision stretches approximately 60° upwards and the same downwards on a horizontal plane. Perimetry is used to test the field of vision. Almost everyone understands that healthy lifestyle is important to maintain healthy and strong body. But have you ever considered that healthy lifestyle can positively influence your vision?

Underline key words and write them out

My questions:

Which questions can be answered by the text? Ask and answer!

Which questions could not be answered by the text?

Description of the situation (shortened)

The central area of retina is responsible for the central vision or visual acuity (see the image). Even though it is a small part of the retina, it is necessary for people to be able to read, sew, see the faces of other people and perform other activities for which the detailed vision is necessary.

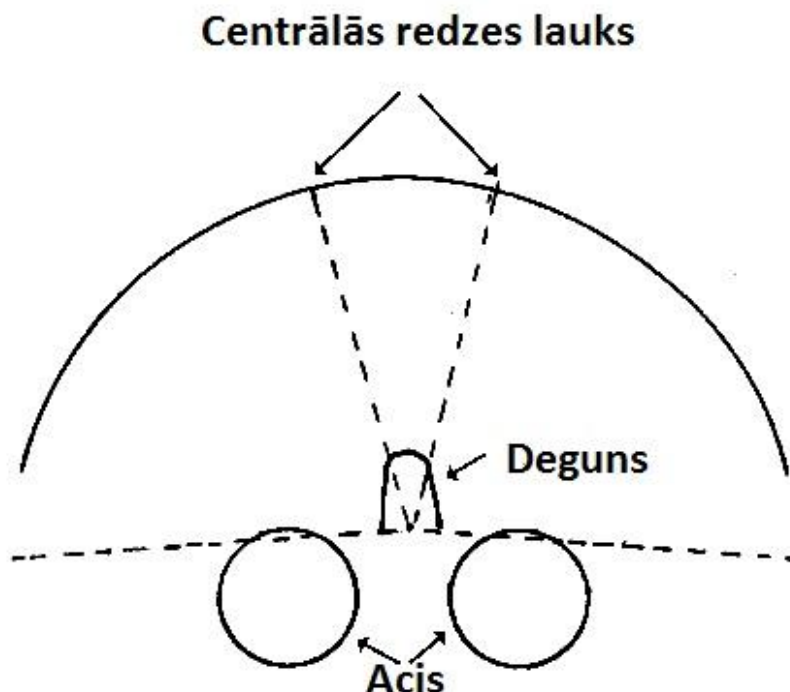
With the help of peripheral or side vision we see objects that are outside the axis of central vision. This vision does not provide as sharp acuity as the central vision, nonetheless it is necessary to orient oneself in the space – see with the corner of one’s eye. It is very important in such careers as sports, driving a vehicle on the road with dense traffic, etc. The side vision is characterized by the field of vision. Field of vision is possible to be measured.

Usually the measuring is done by optometrists with the help of special measuring devices.

(Image: Field of central vision

Nose

Eyes)

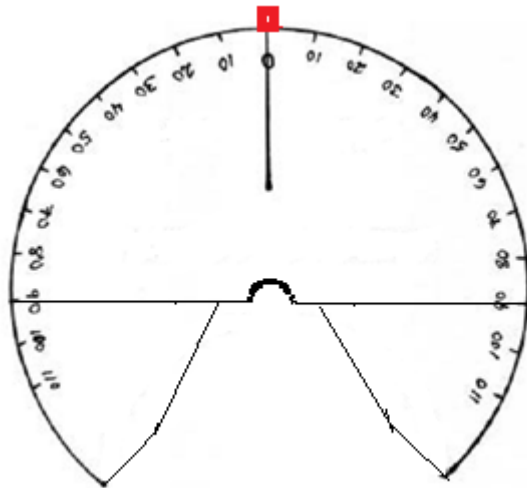


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The problem investigated

Hypothesis

The device for measuring side vision



Equipment

Firm cardboard sheet, scissors, glue, large transporters from the mathematics class, ruler, a nail, a piece of string, writing materials, red appliqué paper, 2x3 cm large cardboard pieces with letters, adhesive tape.

Procedure

1. Create a *string compasses* – a string, to which the pencil has been attached, is tied to a nail, the length of the string being 30 cm.
2. Stick a nail on the edge of a cardboard sheet and by stretching the string draw a circle with a range of 30 cm.
3. Draw a small circle for the nose – range of 2 cm

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4. Cut out the cardboard circle and use it as a pattern to draw on the cardboard sheets as many circles, as many devices necessary.
5. Draw a straight line from the spot the nail was stuck to the rim of the circle. Mark it with 0.
6. Using a large transporter, mark sections on the rim of the circle up to 110 to each side, write their values.
7. Cut out the opening for the head.
8. At the marking 0 glue a bright piece of paper which can be bent upwards – for focussing the look.
9. Prepare 2x3 cardboard pieces with written letters on them. These can be attached to the pencil using adhesive tape so they can be slowly moved along the rim of the circle during the experiment.

Lesson 3-4

Research question

Answer the question:

Why don't drivers on the road full of vehicle get involved in traffic accidents?

Equipment

For each group: a device for measuring the field of side vision;
2-3 cards with letters;
2-3 empty cards;
Markers;
For each student: worksheet for registration of results

Procedure

- 1) Divide the responsibilities within the group:
 - a) An Object whose field of side vision is measured;
 - b) A Recorder who reads off and writes down the two marks (*sees* and *reads*) for both the left and right eye on the worksheet of each participant;
 - c) An observer who makes sure the object fixates the look on the focal line;

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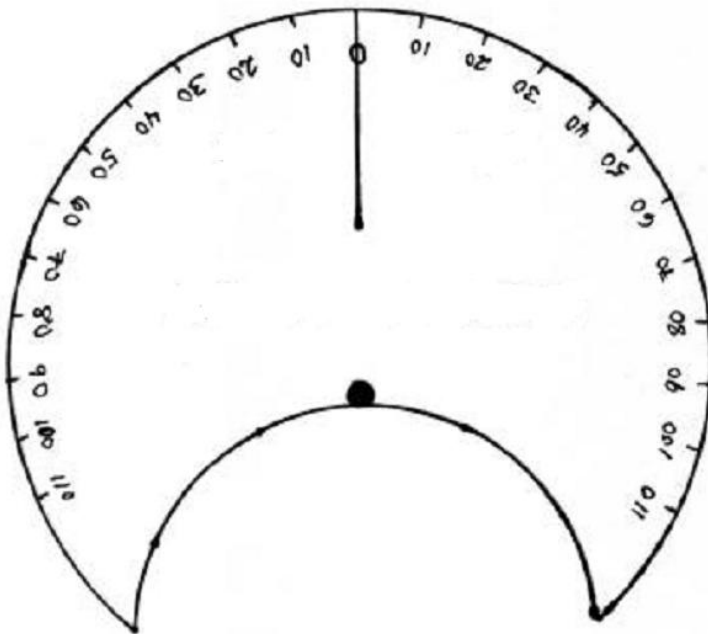
d) An Assistant who slowly moves the letter carrier first from the right side to the centre, then from the left side to the centre.

2) Switch the roles and measure the field of vision of each member of the group.

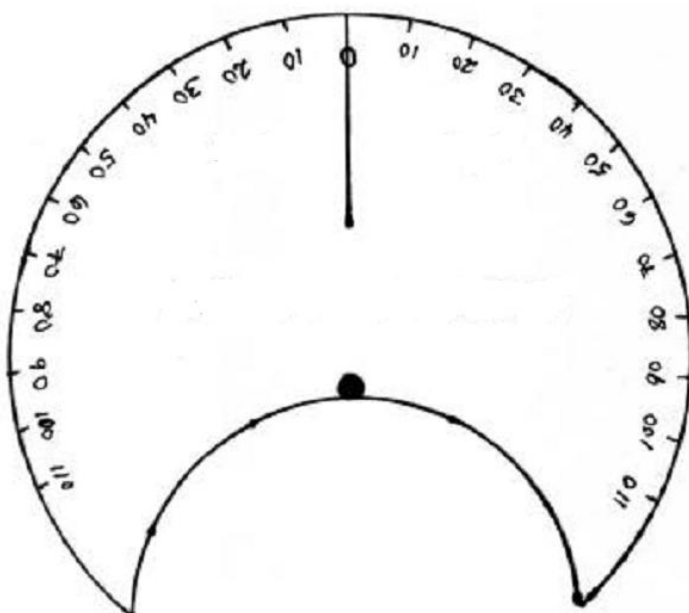
Focussed look – fixedly looks at the red mark.

Unfocussed look – can move eyes to see the object

Data registration



With a focused look



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With an unfocused look

Data processing

1. Join both markings of *Reads* with a black dot and tint the sector thus obtaining the field of central vision.
2. Join both markings of *Sees* with the black dot and shade the sector thus obtaining the field of peripheral vision.
3. Enter your results in the common data registration table: field of the peripheral vision

Table. The field of the peripheral vision total for the grade ...

Student's number	Focused look		Unfocused look	
	Right eye	Left eye	Right eye	Left eye
1.				
2.				
3.				
4.				
...				
Average				

Analysis of data (individually)

1. How did the field of central vision change when it was not necessary to focus the look?

2. How did the field of peripheral vision change when it was not necessary to focus the look?

3. How did the field of vision change when it was necessary to focus the look?

4. What else do the obtained data show?

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Analysis of data (in group)

1. Compare your data to the data of your group mates! What makes your data different?

2. What do all data obtained by your group have in common?

3. Are there any unusual data? What are they?

Analysis of data (whole class)

Study the class data and write questions which you would like to have answered

My questions

Data evaluation

In a course of an experiment, what could have caused the obtaining of inaccurate data?

What else can I study?

Conclusions