



Functional vision testing:
a starting guide for opticians and optician
store sales assistants



Perfect eyesight isn't just sharp. It's also clear, wide, and fast.

What is functional
vision?

Perfect eyesight isn't just sharp. It's also clear, wide, and fast.

Scientific studies* show that good vision consists of more than just visual acuity. It also involves the clarity and speed of vision, and the size of one's visual field. Additionally, it is partly constituted by our ability to focus on targets in our visual field and to act based on what we see.

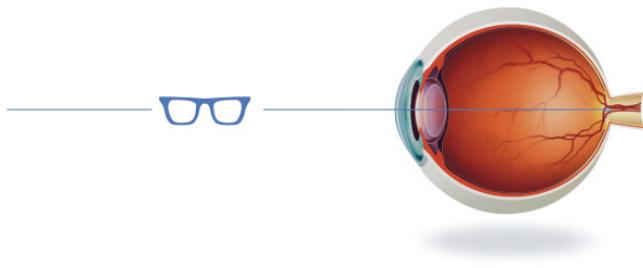
By gaining a more integrated understanding of a client's vision, it is possible to establish concrete means of helping the clients in their everyday life. Changes in functional vision can also indicate a latent, treatable eye disease.

* See the list of research references on page 27.



Visual acuity

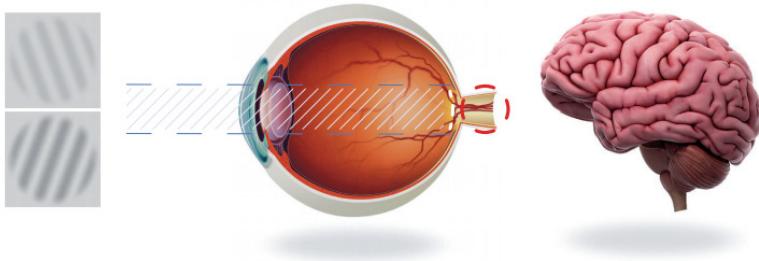
Visual acuity measurement is used to verify that the narrow path to the posterior part of the eye is clear, and that the small sharp-vision area, or fovea, is functioning properly.



“Ocusweep is revolutionising vision examinations. For over 20 years, I have been looking at people’s vision through a small hole. Now, an entirely new level of vision is available to us.”

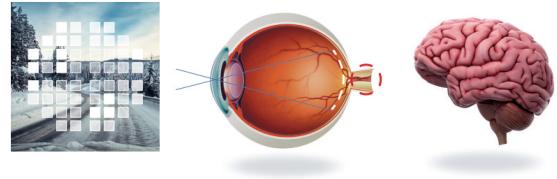
Contrast sensitivity

Contrast vision measurement reveals the ability of the structures of the eye to detect differences in brightness. This is necessary e.g. for face recognition and for our ability to see in poor visual conditions. Contrast vision can be compromised by eye diseases like as cataracts, glaucoma, or diabetes even if visual acuity remains good.



Visual field

Visual field examination is used to measure how the eye, ocular fundus, optic nerve, and the brain perceive different areas of the visual field. An intact visual field is needed for fully functional eyesight. Defects in the visual field can be caused by e.g. diseases of the posterior part of the eye, glaucoma, or a brain tumour.

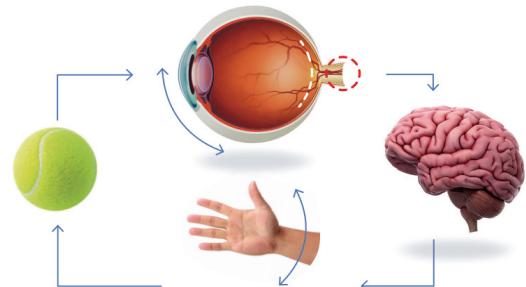


Reaction time

Vision-based reaction time serves as an indication of the speed of the eye/brain coordination. Prolonged reaction time leads to weakened eyesight.

Reaction time field

Reaction time field measures, in addition to the visual field, the speed of your vision and your reactions to events in different parts of the visual field. Seeing is based on agile and precisely-controlled eye movements.





Testing and understanding functional vision enables us to help clients function better in their daily activities.

Clients will learn to anticipate things and to make new moves more subtly than before, whether it's a question of working, driving a car or playing sports.

“Even if a client of mine can see normal letters perfectly well, their contrast vision may have deteriorated. So I tell my client that it is a good idea to pay attention to e.g. the lighting on the stairs at home. And sometimes I urge clients to avoid driving in the dark, or I recommend certain qualities for sunglasses or lenses.”

Decreased visual acuity

- Failure to clearly recognise e.g. traffic signs.
- Failure to accurately recognise text at a normal reading distance.

Slowed reaction time

- Anticipatory reactions – e.g. when driving – are prolonged.

Deficient visual field

- Perceiving objects in the vicinity such as things placed on a table becomes challenging.
- It is often difficult to detect gaps in one's visual field because the brain fills in the picture: a person is not aware of what they cannot see.

Weakened reaction time field

- Ability to react to events occurring in different parts of one's visual field (e.g. in traffic) has deteriorated.

Decreased contrast vision

- Difficulty perceiving one's own dark-coloured jacket in a group of jackets of the same colour.
- Perceiving text against a background particularly in poor lighting becomes challenging.
- When skiing, making out the different shapes of the snowy surface becomes challenging.
- It is dangerous to walk up or down the stairs because the edges become hard to see.

“I am able to provide people with concrete help in their day-to-day activities.”

There is strong and extensive scientific support for the importance of functional vision.

Our sense of sight allows us to make quick, accurate observations of our environment, and to act accordingly- whether it's a question of driving a car, working, or doing something else in our daily lives. This is called functional vision. Its maintenance - and improvement - in the general population is the main goal of eye health care specialists. It is a goal we can attain by preventing vision-threatening diseases, making timely diagnoses, and providing cost-effective treatment.

We are often not even aware of our vision problems because our brains are adroit at filling in gaps - we do not notice what we fail to see - which is why it is important to measure functional vision. This is particularly true if a person is running a risk of catching eye diseases or has already been diagnosed with a disease. In such cases the person's vision should be monitored more closely under the instructions of an eye doctor.

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Ocusweep measures the key dimensions of functional vision.



OCUSWEEP TESTS

VISUAL ACUITY

Far and near vision, ability to distinguish details

CONTRAST VISION

The test measures eyesight clarity. Impaired contrast vision makes it difficult to recognise objects even if one's visual acuity is good.

VISUAL FIELD

The test measures the height, width and integrity of one's visual field. The brain fills in gaps in the visual field, so changes in one's visual field are difficult to detect without tests. Gaps in one's visual field can be caused by a progressive, treatable illness.

REACTION TIME FIELD

The test measures a person's ability to discern things across the entire visual field and to react to them appropriately.

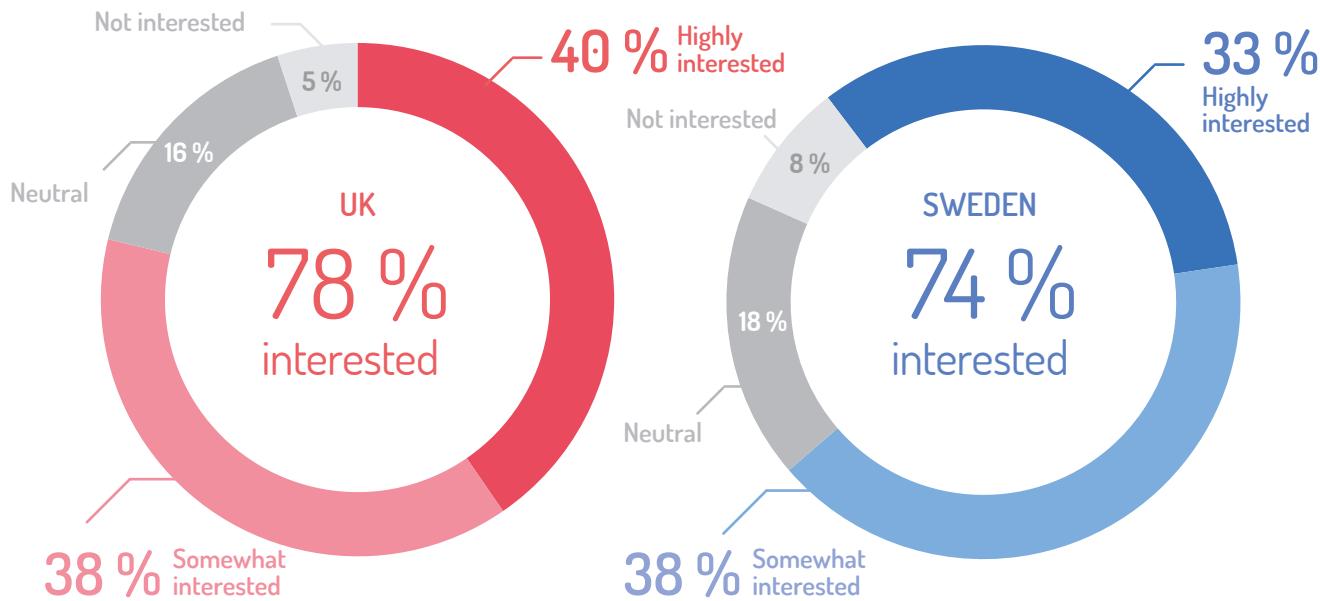
REACTION TIME

Vision-based reaction time serves to indicate how quickly the eyes and brain work together. Prolonged reaction time leads to impaired visual ability.

Clients are already interested in functional vision

According to consumer studies conducted in the UK and Sweden, consumers are highly interested in their functional vision. The reception has been positive in Finland as well.

People interested in having their functional vision examined, as a percentage of the population:



Clients visit opticians for several different reasons. There are two main reasons for being interested in functional vision.

1 Peace of mind

“I can be sure that there is nothing to worry about my vision.”

“I don’t want to cause any harm or accidents to other people.”

“Glaucoma runs in my family.”

2 Interest in new developments in the field of health and wellness

“The tests are fascinating. I want to compare my results to how others did.”

“I like to know things. Particularly when it comes to data related to my health.”

“It would be good to know as much as possible about my health and welfare. I value the opportunity to understand more.”

Client expectations / meeting clients

Tips and ideas for approaching clients
when examining their functional vision.

3X

ANSWER FOR THREE CLIENT'S QUESTIONS:

1) Why is functional vision important?

2) What can be done right now with regard to measuring functional vision?

3) How is functional vision assessed? How are the examinations done and how do they progress?

Client expectations: **Why?**

Clients expect to receive concrete facts. Tell the client in a sufficiently down-to-earth manner **why** functional vision is important.

The measurement of vision is developing.

Most consumers still do not know everything that good vision really involves.

Functional vision is much more than letters on a board. It affects our ability to move, function, and read. It helps us at home, at work, and at school. It even helps us achieve better results in sports.

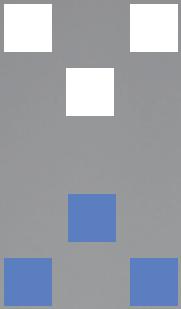
- Why is it sometimes difficult to find a dark jacket in a group of other, similarly-coloured jackets?
- Why does it feel harder to drive in the dark?
- Why is it difficult to see in bright light and sunlight?



TIP

Analyse the client's needs. Use everyday examples to provide a concrete view of situations where seeing is involved.

It is natural and responsible to talk about functional vision when analysing the backgrounds and needs of clients.



“I talk about visual health matters, analyse clients’ backgrounds, and discuss possibilities.”

“If we think about contrasts, for example... Nowadays I come by situations every day in which I find myself thinking that I require good contrasts or the solid functioning of my entire visual field. I notice that older people do not see anything to their side when aqua-jogging. Or, when I have been skiing, and there is snow and the sun is shining, my vision is poorer.”

“Awareness is the key. Even if your vision does not improve, it helps if you are aware of where you stand. You can cope better in your daily life if you know about the things that affect your vision.”



Client expectations: What?

Your client will expect the appointment to be as effortless as possible. You should give your client alternatives as to **what** can be done right now as regards to measuring functional vision.



Example 1

EXAMINATION OF FUNCTIONAL VISION AS AN EXTRA SERVICE

A traditional free service or a more modern, comprehensive paid service?

A

Traditional visual acuity examination

- Visual acuity
- Prescription for glasses

- Free / examination fee __ €

B

Comprehensive functional vision examination

- Visual acuity
- Contrast vision
- Visual field
- Reaction time / Reaction time field
 - Prescription for glasses
 - Assessment of real visual ability
 - Identification of latent eye diseases

- Examination fee __ €



TIP

Provide guidance so that the client can make a clear choice.

Examination of functional vision can be organised differently depending on the company, either as an extra service or as a starting point for all examinations.



Example 2

FUNCTIONAL VISION AS A STARTING POINT FOR EXAMINATIONS

An examination of functional vision can be used to create an overview of the situation with a view to determining the next stages in the process.

Stage 1 - Screening  Stage 2 

Ocusweep functional vision examination

- Visual acuity
- Contrast vision
- Visual field
- Reaction time / Reaction time field

-> Vision report

A Everything looks OK. Great!

- Follow-up after two years.
- Modification of sunglasses?
- Treatment for dry eyes?
- A thorough health examination of the eyes by an optician is recommended.

B Anomalies in the results.

- Traditional vision examination, and determination of recommended strength of glasses.
- Imaging of the fundus of the eyes, and measurement of eye pressure.
- Referral to a doctor if needed.

Client expectations: **How?**

Your client will want to be aware of what is going on.
Explain the different stages of the process to your client:
how is functional vision assessed?

Your client will want to be able to anticipate the future stages of the process and to remain in their comfort zone.

By staying one step ahead, and by continually informing the clients about the future stages and what these stages mean, we create a safe and comfortable environment for them.

Explaining texts and test results to clients in a detailed but understandable way is the key.

- What will we be doing?
- What will happen next?
- What do the results mean?
- How can the results be interpreted later when I'm at home?



TIP

Stay one step ahead of the client: anticipate, and make sure you continually explain what is coming next.

How are the examinations done? How are the results interpreted?

A decorative pattern of white and blue squares scattered across the top half of the image, which shows a landscape of reddish-brown hills under a cloudy sky.

“The happiest clients have good test results. No one wants bad results. Clients want to be assured that everything is OK with them. They appreciate modern techniques.”

“An elderly person who has had new glasses made but still cannot see very well comes to us for help. We then do tests and notice that there are gaps in his visual field on the sides, and that his contrast vision is poor.

We help him by providing recommendations for turning the eyes to the side while driving and for increased lighting at home.

It isn't always necessary to sell new lenses. By providing assistance, you can create better, deeper, and more durable customer relationships.”

A decorative pattern of white squares located at the bottom of the image, which shows a wooden boardwalk winding through a landscape of reddish-brown hills.

Quick Guide

Prior to examination

- Have the subject sit firmly in place.
- Adjust the inclination of the device to the proper angle.
- Inform the client about the tests.

During the examination

- Inform the client about one test at a time.
- Make sure the client understands the instructions.
- Monitor the testing procedure

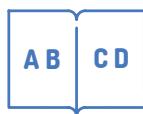
	What should you explain to your client about the tests?	Quick guide for the patient
<p>Generally, prior to the tests</p>	<ul style="list-style-type: none"> • We measure the following: visual acuity, contrast vision, visual field, reactions, and eye movement. • The tests take a total of 10-20 minutes. • These tests help you understand how your vision works in everyday situations: how you observe your surroundings, how clear your vision is, and how quickly you are able to react to situations e.g. while driving, working, or playing a sport. This is called functional vision. • Even though it is not always possible to improve one's vision, one's ability to cope in everyday life improves if one knows what factors affect one's vision. 	
<p>Visual acuity</p>	<ul style="list-style-type: none"> • Visual acuity is measured by using distance vision, terminal vision and near vision tests. • Visual acuity is the traditional metric for assessing a person's need for glasses. • The test quickly reveals whether the client needs (new) glasses. 	<p>Press the button for the side indicated by the figure (do not make a guess).</p>
<p>Contrast vision</p>	<ul style="list-style-type: none"> • By measuring contrast vision, we assess how clearly you can see. • Can you see lights, shadows and shades of grey very well? Are you able to distinguish objects well in dim lighting, or in bad weather? • For example, are you able to distinguish a white plate against the background of a white table? 	<p>Press the button for the side towards which the stripes are inclined (do not make a guess).</p>
<p>Visual field</p>	<ul style="list-style-type: none"> • One does not always necessarily notice gaps in one's own vision. A good and even visual field is essential to your visual abilities in general. • Flashes of varying intensities will appear on the surface of the device, in your visual field. This allows us to assess the integrity of your visual field, i.e. whether you can see the flashes at all, whether you can see them at a low intensity, or whether you can only see them at a high intensity. 	<p>Look at the oval figure and press the button if you see a flash. Only one button is used in this test.</p>
<p>Reaction time</p>	<ul style="list-style-type: none"> • The reaction time test measures the speed at which your eyes, brain and hands work, and it can give an indication of your brain's processing speed. • Vision-based reaction time affects your safe functioning. 	<p>Keep your thumbs on the buttons and answer as quickly as possible to the direction of the figure.</p>
<p>Reaction time field</p>	<ul style="list-style-type: none"> • The reaction time field test determines how well your entire visual system functions. • A good result on the test requires a normal visual field and a good focus and a solid control of eye movements as well as quick processing of observations. • For example, this test can assess your ability to react while driving in traffic to sudden events at the periphery of your visual field. 	<p>Follow the flash -- as quickly as possible, press the button for the direction indicated by the arrow.</p>

Quick guide to Ocusweep examination results

	Typical symptoms	What should you tell your client about reduced results?	What instructions should be given?
 <p>Visual acuity</p>	<ul style="list-style-type: none"> • Far distance vision: Inability to clearly identify e.g. traffic signs. • Near vision: Inability to clearly recognise text at a normal reading distance on a phone screen etc. • Terminal vision: When working at a computer, you may have difficulty reading text or finding the mouse cursor. • Poor visual acuity can cause e.g. headaches. 	<ul style="list-style-type: none"> • Refractive errors can be easily corrected in several ways, for instance by having glasses checked or adjusted • If the results remain poor even after adjustment, the reason needs to be investigated by further tests. 	<ul style="list-style-type: none"> • Glasses, contact lenses, moisturising eye drops. • Vision rehabilitation services, accessories. • If a person's visual acuity cannot be improved with corrected glasses, referral to the eye doctor.
 <p>Contrast vision</p>	<ul style="list-style-type: none"> • Difficulty perceiving a dark-coloured jacket in a group of jackets of a similar colour. • When skiing, difficulty making out the different shapes of the snow surface. • Walking on stairs can be challenging, even dangerous, due to difficulty in perceiving edges. • Difficulty recognising faces. 	<ul style="list-style-type: none"> • Reduced contrast vision is a normal development as one ages. • It can also be a symptom of diseases. 	<ul style="list-style-type: none"> • Filter glasses • Increased lighting by using e.g. a reading lamp on the table. • Increased lighting on stairs and in more hazardous locations. • If the cause is unclear, referral to an eye doctor.

	Typical symptoms	What should you tell your client about reduced results?	What instructions should be given?
 <p>Visual field</p>	<ul style="list-style-type: none"> • It is often difficult to detect defects in one's visual field because the brain patches up the picture. You don't know what you fail to notice. • It may be that you are not seeing certain objects around you, and it may be challenging to perceive an 	<ul style="list-style-type: none"> • In order to learn more about possible defects in your visual field, more accurate measurements are recommended, one eye at a time. 	<ul style="list-style-type: none"> • Consider the possibility of visual defects e.g. while driving: If there are defects in one's visual field on e.g. the left, it is important to turn one's eyes to the left at a greater angle than usual. • If a new problem is discovered, the client should be referred to an eye doctor.
 <p>Reaction time</p>	<ul style="list-style-type: none"> • Seeing and anticipating things take more time e.g. when driving 	<ul style="list-style-type: none"> • It is advisable to take slow reaction times into consideration in everyday life. 	<ul style="list-style-type: none"> • Traffic safety and anticipatory abilities are particularly important (e.g. greater safety distances). • Reaction time can be improved e.g. by playing fast-tempo games.
<p>Reaction time field</p>	<ul style="list-style-type: none"> • It takes more time to make vision-based decisions. • E.g. when driving prolonged reactions to sudden events in different parts of one's visual field. 	<ul style="list-style-type: none"> • A weakened result can be due to a variety of causes such as eye mobility or impaired visual perception ability in the brain. • For more information about possible defects in your visual field, more accurate measurements are recommended, one eye at a time. 	<ul style="list-style-type: none"> • For those who play sports, it may be beneficial to monitor your condition by means of reaction time measurements

Vision report statements



Visual acuity

	Reduced	Normal	Excellent
Distance vision	<p>You could benefit from new distance glasses. A lower than normal result means that you may not be able to easily distinguish faraway objects such as traffic signs.</p>	<p>You can see faraway things well. You can distinguish e.g. traffic signs, even from a great distance.</p>	<p>You can see faraway things very well. You can easily notice e.g. traffic signs, even from a great distance.</p>
Terminal vision	<p>You could benefit from new glasses. A lower than normal result means that you may sometimes have difficulties reading texts and seeing things at typical working distances e.g. when working at a computer terminal.</p>	<p>You can see well at typical working distances. You can read text and see things at typical working distances e.g. when working at a computer terminal.</p>	<p>You can see very well at typical working distances. You can easily read text and see things at typical working distances e.g. when working at a computer terminal.</p>
Near vision	<p>You could benefit from new reading glasses. A lower than normal result means that your eyes need to work more, they may become tired more quickly, and you may have to use more light when reading small text or examining objects at an excessively close range.</p>	<p>You can see well from a normal reading distance. You can see text from short distances (e.g. on your phone's screen or when reading a book).</p>	<p>You can see very well from a normal reading distance. You can see even small text easily and accurately from short distances (e.g. on your phone's screen or when reading a book).</p>

Contrast vision

Reduced	Normal	Excellent
<p>Your results are weaker than normal. This result means that you perceive and distinguish things worse than normally, particularly in difficult weather conditions and in dim ambient light.</p>	<p>You can see clearly. You can see light, shadows and shades of grey well. There is no haziness in your vision, and you can distinguish objects even in poor weather and in dim ambient light.</p>	<p>You can see very clearly. You can see light, shadows and shades of grey very well. There is no haziness in your vision, and you can distinguish objects clearly even in poor weather and in dim ambient light.</p>

Integrity of central visual field

Reduced	Slightly reduced	Excellent
<p>Defects were found in your central visual field. The test showed defects in your visual field, and it is important to understand that these problems are not necessarily detectable in everyday life. Follow-up examinations are recommended.</p>	<p>There are slight changes in your visual field. The changes probably do not affect your ability to observe your surroundings. It is advisable to monitor the situation on a regular basis.</p>	<p>Your central visual field is in very good condition. Good sensitivity in your visual field helps you observe your surroundings and perceive even weakly-distinguishable objects.</p>

Reaction time

Reduced	Normal	Excellent
<p>Your vision-based reaction capacity is slower than normal. If your result is "reduced", this means that you may sometimes have difficulties reacting quickly to events that you see. It also serves as an indication of the speed of your eye, brain and hand coordination.</p>	<p>Your vision-based reaction capacity is fast. Your eyes, brain and hands function in quick coordination.</p>	<p>Your vision-based reaction capacity is very fast. Your eyes, brain and hands function in very quick coordination.</p>

Classification of results



Visual acuity



Contrast vision



Reaction time



Integrity of central visual field

	Reduced	Reduced	Reduced	Reduced
< 0.9		<p>Weaker-than-normal contrast vision (Worse than 95 % of those in the same age group with normal vision.)</p>	<p>Slower-than-normal vision-based reaction time. (Worse than 95 % of those in the same age group with normal vision.)</p>	<p>Local variation and / or clearly worse-than-normal sensitivity of visual field - possibly defects in the visual field.</p>
0.9 - 1.1	Normal	Normal	Normal	Slightly reduced
		<p>Normal contrast vision.</p>	<p>Normal vision-based reaction time. (Represents 5-50 % of those in the same age group with normal vision.)</p>	<p>Slightly lower-than-normal sensitivity of visual field, or small degree of deficiency of visual field; little or no local variation.</p>
	Excellent	Excellent	Excellent	Normal/Excellent
> 1.1		<p>Better-than-average contrast vision.</p>	<p>Better-than-average vision-based reaction time.</p>	<p>Normal / Excellent central visual field.</p>

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