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IF IT IS TOO SMALL TO READ

COME  
CLO  
SER

## Magnification can compensate for low visual acuity



People with low vision are those with a visual acuity less than 0.3 (6/18 or 20/60). To read or see small things at near, they need to increase the image of the text or object on their retina. This can be done in several ways: 1) by making the letters or object larger and clearer using high contrast, 2) by coming closer to the text while using strong reading glasses or 3) by using a hand or stand magnifier. It is also possible to combine any of these methods.

A larger image on the retina makes it possible to interpret texts and images correctly even if the visual acuity is low. The lowest the visual acuity, the more magnification is needed or more times (X) the object needs to be made bigger. This is most easily done by moving the text and the image closer to the eyes. However, in order to have clear images on the retina, the person with low vision needs to use strong reading glasses also called magnifying spectacles. When the image is magnified and sharp, the person with low vision will be able to read again.

### Magnification: from small to more than 50X

Reading glasses can enlarge the text from 1X to 10X. The same effect can be achieved by looking at the text with a hand held or stand magnifier. If the magnification is not sufficient, the person with low vision has to use a closed circuit TV (CCTV), which is an electronic system with a camera and a screen monitor that can increase images up to 100X.

Other magnifying tools are available for people with low vision. A magnifying mirror can be useful to shave or put on makeup. Also, special software can provide magnification on the computer screen. Monocular or telescope spectacles can be used to look at TV or more distant objects.

### Posture and light

As the need for magnification increases, the distance between the eyes and the text becomes smaller. While the normal reading distance is 30-40 cm, powerful magnification can require a distance as low as 2,5 cm. If a person is using higher power glasses for long periods of times with the head bent down, she will get neck pain and headaches. To avoid these problems, the person should always keep the text at the level of the eyes. In the beginning, it is often best to sit with the elbows on the table, the back and neck straight, holding the text with both hands.

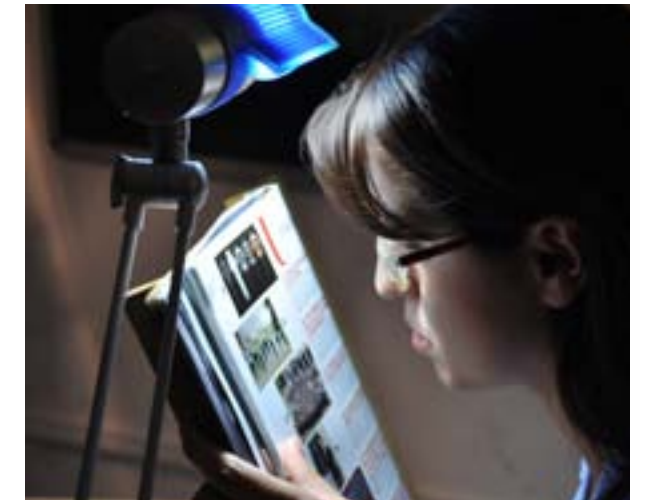
It is important to keep the text at a precise distance from the eyes because as soon the reading distance is changed, the text becomes blurry. Also, when a person is reading at a distance shorter than 10 cm, it is better to move the text and keep the head and the eyes in a fixed position. At all times, it is essential to ensure that there is enough light on the object or text that is being magnified.



### How to use the COME CLOSER material

This booklet contains nine double-page spreads built on the same pattern: the left page with two texts of different sizes, and the right page with the picture of someone reading. The text in the upper part of the left pages is printed in standard size, except for page four, all through the booklet. The text below is larger, and its size increases from one double-page to the next. The red stripe on the top of the left page indicates the size of magnification and the dioptries needed in the reading glasses to read the small text. The person on the picture on the right side of the spread is reading using the glasses and

the reading distance described on the top left stripe. A ruler on the bottom left illustrates the exact distance needed to get a sharp image. This is based on the optical properties of the lens. A young person who uses accommodation might want to get even closer to the text.



You can use 'Come Closer' to find the magnification you need to read normal print by following these steps:

- Start with page 22. Read the large text on the left side at a distance of 25 cm. Turn the pages and read until the text appears blurry.
- When the text becomes too small to be read, look at the top of the left page: this is the magnification and the power of the spectacles needed to read the small text. The right page demonstrates a person using these spectacles. The distance between the eyes and the text is determined by the power of the lenses.

## NO MAGNIFICATION

ADD +2,5-3,0D

33-40  
CM

Small text with regular reading glasses and normal reading distance, 33-40 cm.

8 p Alice opened the door and found that it led into a small passage, not much larger than a rat-hole: she knelt down and looked along the passage into the loveliest garden you ever saw. How she longed to get out of that dark hall, and wander about among those beds of bright flowers and those cool fountains, but she could not even get her head through the doorway; 'and even if my head would go through,' thought poor Alice, 'it would be of very little use without my shoulders. Oh, how I wish I could shut up like a telescope! I think I could, if I only know how to begin.' For, you see, so many out-of-the-way things had happened lately, that Alice had begun to think that very few things indeed were really impossible.

6 p There seemed to be no use in waiting by the little door, so she went back to the table, half hoping she might find another key on it, or at any rate a book of rules for shutting people up like telescopes: this time she found a little bottle on it, ('which certainly was not here before,' said Alice,) and round the neck of the bottle was a paper label, with the words 'DRINK ME' beautifully printed on it in large letters.

It was all very well to say 'Drink me,' but the wise little Alice was not going to do THAT in a hurry. 'No, I'll look first,' she said, 'and see whether it's marked "poison" or not'; for she had read several nice little histories about children who had got burnt, and eaten up by wild beasts and other unpleasant things, all because they WOULD not remember the simple rules their friends had taught them: such as, that a red-hot poker will burn you if you hold it too long; and that if you cut your finger VERY deeply with a knife, it usually bleeds; and she had never forgotten that, if you drink much from a bottle marked 'poison,' it is almost certain to disagree with you, sooner or later.

However, this bottle was NOT marked 'poison,' so Alice ventured to taste it, and finding it very nice, (it had, in fact, a sort of mixed flavour of cherry-tart, custard, pine-apple, roast turkey, toffee, and hot buttered toast,) she very soon finished it off.

\* \* \* \* \*

'What a curious feeling!' said Alice; 'I must be shutting up like a telescope.' And so it was indeed: she was now only ten inches high, and her face brightened up at the thought that she was now the right size for going through the little door into that lovely garden. First, however, she waited for a few minutes to see if she was going to shrink any further: she felt a little nervous about this; 'for it might end, you know,' said Alice to herself, 'in my going out altogether, like a candle. I wonder what I should be like then?' And she tried to fancy what the flame of a candle is like after the candle is blown out, for she could not remember ever having seen such a thing.

After a while, finding that nothing more happened, she decided on going into the garden at once; but, alas for poor Alice! when she got to the door, she found she had forgotten the little golden key, and when she went back to the table for it, she found she could not possibly reach it: she could see it quite plainly through the glass, and she tried her best to climb up one of the legs of the table, but it was too slippery; and when she had tired herself out with trying, the poor little thing sat down and cried.

'Come, there's no use in crying like that!' said Alice to herself, rather sharply; 'I advise you to leave off this minute!' She generally gave herself very good advice, (though she very seldom followed it), and sometimes she scolded herself so severely as to bring tears into her eyes; and once she remembered trying to box her own ears for having cheated herself in a game of croquet she was playing against herself, for this curious child was very fond of pretending to be two people.

'But it's no use now,' thought poor Alice, 'to pretend to be two people! Why, there's hardly enough of me left to make ONE respectable person!'





# 1 TIME MAGNIFICATION 1X

ADD +4D

25  
CM

One time magnification with 4 diopters in the spectacles gives a reading distance of 25 cm.

8 p She was close behind it when she turned the corner, but the Rabbit was no longer to be seen: she found herself in a long, low hall, which was lit up by a row of lamps hanging from the roof.

There were doors all round the hall, but they were all locked; and when Alice had been all the way down one side and up the other, trying every door, she walked sadly down the middle, wondering how she was ever to get out again.

Suddenly she came upon a little three-legged table, all made of solid glass; there was nothing on it except a tiny golden key, and Alice's first thought was that it might belong to one of the doors of the hall; but, alas! either the locks were too large, or the key was too small, but at any rate it would not open any of them. However, on the second time round, she came upon a low curtain she had not noticed before, and behind it was a little door about fifteen inches high: she tried the little golden key in the lock, and to her great delight it fitted!

8 p Down, down, down. There was nothing else to do, so Alice soon began talking again. 'Dinah'll miss me very much to-night, I should think!' (Dinah was the cat.) 'I hope they'll remember her saucer of milk at tea-time. Dinah my dear! I wish you were down here with me! There are no mice in the air, I'm afraid, but you might catch a bat, and that's very like a mouse, you know. But do cats eat bats, I wonder?' And here Alice began to get rather sleepy, and went on saying to herself, in a dreamy sort of way, 'Do cats eat bats? Do cats eat bats?' and sometimes, 'Do bats eat cats?' for, you see, as she couldn't answer either question, it didn't much matter which way she put it.

She felt that she was dozing off, and had just begun to dream that she was walking hand in hand with Dinah, and saying to her very earnestly, 'Now, Dinah, tell me the truth: did you ever eat a bat?' when suddenly, thump! thump! down she came upon a heap of sticks and dry leaves, and the fall was over.

Alice was not a bit hurt, and she jumped up on to her feet in a moment: she looked up, but it was all dark overhead; before her was another long passage, and the White Rabbit was still in sight, hurrying down it. There was not a moment to be lost: away went Alice like the wind, and was just in time to hear it say, as it turned a corner, 'Oh my ears and whiskers, how late it's getting!'

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There were doors all round the hall, but they were all locked; and when Alice had been all the way down one side and up the other, trying every door, she walked sadly down the middle, wondering how she was ever to get out again.

Suddenly she came upon a little three-legged table, all made of solid glass; there was nothing on it except a tiny golden key, and Alice's first thought was that it might belong to one of the doors of the hall; but, alas! either the locks were too large, or the key was too small, but at any rate it would not open any of them. However, on the second time round, she came upon a low curtain she had not noticed before, and behind it was a little door about fifteen inches high: she tried the little golden key in the lock, and to her great delight it fitted! Alice opened the door and found that it led into a small passage, not much larger than a rat-hole: she knelt down and looked along the passage into the loveliest garden you ever saw. How she longed to get out of that dark hall, and wander about among those beds of bright flowers and those cool fountains, but she could not even get her head through the doorway; 'and even if my head would go through,' thought poor Alice, 'it would be of very little use without my shoulders. Oh, how I wish I could shut up like a telescope! I think I could, if I only know how to begin.' For, you see, so many out-of-the-way things had happened lately, that Alice had begun to think that very few things indeed were really impossible.



1,5 TIME MAGNIFICATION 1,5X

ADD +6D

**Stronger spectacles give better readability but a shorter reading distance.**

8 p She felt that she was dozing off, and had just begun to dream that she was walking hand in hand with Dinah, and saying to her very earnestly, 'Now, Dinah, tell me the truth: did you ever eat a bat?' when suddenly, thump! thump! down she came upon a heap of sticks and dry leaves, and the fall was over.

Alice was not a bit hurt, and she jumped up on to her feet in a moment: she looked up, but it was all dark overhead; before her was another long passage, and the White Rabbit was still in sight, hurrying down it. There was not a moment to be lost: away went Alice like the wind, and was just in time to hear it say, as it turned a corner, 'Oh my ears and whiskers, how late it's getting!'

12 p 'Well!' thought Alice to herself, 'after such a fall as this, I shall think nothing of tumbling down stairs! How brave they'll all think me at home! Why, I wouldn't say anything about it, even if I fell off the top of the house!' (Which was very likely true.)

Down, down, down. Would the fall NEVER come to an end! 'I wonder how many miles I've fallen by this time?' she said aloud. 'I must be getting somewhere near the centre of the earth. Let me see: that would be four thousand miles down, I think--' (for, you see, Alice had learnt several things of this sort in her lessons in the schoolroom, and though this was not a VERY good opportunity for showing off her knowledge, as there was no one to listen to her, still it was good practice to say it over) '--yes, that's about the right distance-- but then I wonder what Latitude or Longitude I've got to?' (Alice had no idea what Latitude was, or Longitude either, but thought they were nice grand words to say.)

Presently she began again. 'I wonder if I shall fall right THROUGH the earth! How funny it'll seem to come out among the people that walk with their heads downward! The Antipathies, I think--' (she was rather glad there WAS no one listening, this time, as it didn't sound at all the right word) '--but I shall have to ask them what the name of the country is, you know. Please, Ma'am, is this New Zealand or Australia?' (and she tried to curtsy as she spoke--fancy CURTSEYING as you're falling through the air! Do you think you could manage it?) 'And what an ignorant little girl she'll think me for asking! No, it'll never do to ask: perhaps I shall see it written up somewhere.'

16,6  
CM





**12,5  
CM**

**An unusual reading distance which make it possible to read when vision is poor.**

8 p Down, down, down. There was nothing else to do, so Alice soon began talking again. 'Dinah'll miss me very much to-night, I should think!' (Dinah was the cat.) 'I hope they'll remember her saucer of milk at tea-time. Dinah my dear! I wish you were down here with me! There are no mice in the air, I'm afraid, but you might catch a bat, and that's very like a mouse, you know. But do cats eat bats, I wonder?' And here Alice began to get rather sleepy, and went on saying to herself, in a dreamy sort of way, 'Do cats eat bats? Do cats eat bats?' and sometimes, 'Do bats eat cats?' for, you see, as she couldn't answer either question, it didn't much matter which way she put it.

16 p The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly down, so suddenly that Alice had not a moment to think about stopping herself before she found herself falling down a very deep well.

Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her and to wonder what was going to happen next. First, she tried to look down and make out what she was coming to, but it was too dark to see anything; then she looked at the sides of the well, and noticed that they were filled with cupboards and book-shelves; here and there she saw maps and pictures hung upon pegs.

She took down a jar from one of the shelves as she passed; it was labelled 'ORANGE MARMALADE', but to her great disappointment it was empty: she did not like to drop the jar for fear of killing somebody, so managed to put it into one of the cupboards as she fell past it.



10  
CM

With these spectacles, it might be easier to move the text in front of the eyes.

8 p Presently she began again. 'I wonder if I shall fall right THROUGH the earth! How funny it'll seem to come out among the people that walk with their heads downward! The Antipathies, I think--' (she was rather glad there WAS no one listening, this time, as it didn't sound at all the right word) '--but I shall have to ask them what the name of the country is, you know. Please, Ma'am, is this New Zealand or Australia?' (and she tried to curtsy as she spoke--fancy CURTSEYING as you're falling through the air! Do you think you could manage it?) 'And what an ignorant little girl she'll think me for asking! No, it'll never do to ask: perhaps I shall see it written up somewhere.'

20 p but when the Rabbit actually TOOK A WATCH OUT OF ITS WAISTCOAT-POCKET, and looked at it, and then hurried on, Alice started to her feet, for it flashed across her mind that she had never before seen a rabbit with either a waistcoat-pocket, or a watch to take out of it, and burning with curiosity, she ran across the field after it, and fortunately was just in time to see it pop down a large rabbit-hole under the hedge.

In another moment down went Alice after it, never once considering how in the world she was to get out again.





Find the right sitting and reading position, do not bend the head forward and move the text.

8 p Down, down, down. Would the fall NEVER come to an end! 'I wonder how many miles I've fallen by this time?' she said aloud. 'I must be getting somewhere near the centre of the earth. Let me see: that would be four thousand miles down, I think--' (for, you see, Alice had learnt several things of this sort in her lessons in the schoolroom, and though this was not a VERY good opportunity for showing off her knowledge, as there was no one to listen to her, still it was good practice to say it over) '--yes, that's about the right distance--but then I wonder what Latitude or Longitude I've got to?' (Alice had no idea what Latitude was, or Longitude either, but thought they were nice grand words to say.)

24 p of getting up and picking the daisies, when suddenly a White Rabbit with pink eyes ran close by her.

There was nothing so VERY remarkable in that; nor did Alice think it so VERY much out of the way to hear the Rabbit say to itself, 'Oh dear! Oh dear! I shall be late!' (when she thought it over afterwards, it occurred to her that she ought to have wondered at this, but at the time it all seemed quite natural);

8,5  
CM





6,2  
CM

Move the text past these strong glasses and keep the head still.

8 p She took down a jar from one of the shelves as she passed; it was labelled 'ORANGE MARMALADE', but to her great disappointment it was empty: she did not like to drop the jar for fear of killing somebody, so managed to put it into one of the cupboards as she fell past it.

'Well!' thought Alice to herself, 'after such a fall as this, I shall think nothing of tumbling down stairs! How brave they'll all think me at home! Why, I wouldn't say anything about it, even if I fell off the top of the house!' (Which was very likely true.)

32 p 'and what is the use of a book,'  
thought Alice 'without pictures or  
conversation?'

So she was considering in her  
own mind (as well as she could,  
for the hot day made her feel very  
sleepy and stupid), whether the  
pleasure of making a daisy-chain  
would be worth the trouble



4  
CM

It is sometimes easier to look above or below the text.

8 p

In another moment down went Alice after it, never once considering how in the world she was to get out again. The rabbit-hole went straight on like a tunnel for some way, and then dipped suddenly down, so suddenly that Alice had not a moment to think about stopping herself before she found herself falling down a very deep well.

Either the well was very deep, or she fell very slowly, for she had plenty of time as she went down to look about her and to wonder what was going to happen next. First, she tried to look down and make out what she was coming to, but it was too dark to see anything; then she looked at the sides of the well, and noticed that they were filled with cupboards and book-shelves; here and there she saw maps and pictures hung upon pegs.

48 p

once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it,





Find the best retinal area and move the text in front of your best eye.

8 p

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64 p

of sitting by her  
sister on the  
bank and of  
having nothing  
to do:

3,1  
CM



10 TIMES MAGNIFICATION 10X

ADD +40D

2,5  
CM

Make sure you keep the exact reading distance and the right angle of vision.

8 p Alice was beginning to get very tired of sitting by her sister on the bank, and of having nothing to do: once or twice she had peeped into the book her sister was reading, but it had no pictures or conversations in it, 'and what is the use of a book,' thought Alice 'without pictures or conversation?'

So she was considering in her own mind (as well as she could, for the hot day made her feel very sleepy and stupid), whether the pleasure of making a daisy-chain would be worth the trouble of getting up and picking the daisies, when suddenly a White Rabbit with pink eyes ran close by her.

80 p

# Alice was beginning to get very tired





Established at the Linnaeus University in Kalmar, Sweden, in 2008, the SEEnior Project has created an extensive set of rehabilitation materials for people with age related macular degeneration (ARMD) and for the professionals that support them. The project team consisted of Krister Inde, project leader and low vision therapist, Jörgen Gustafsson, Kirsten Kobberø and Gaute Mohn Jenssen, optometrists, Jytte Mejlvang and Arne Tömta, low vision therapists, and Kirsten Baggesen, ophthalmologist. The project was implemented with the support of organisations for the visually impaired in the Scandinavian countries and companies delivering optical and other devices to low vision rehabilitation in Sweden, Denmark and Norway.

The English adaptation of the original version, Kom Närmare (in Swedish) was made at the German Jordanian University, Amman, Jordan, with the permission of the authors. The copyright belongs to the Linnaeus University, Kalmar, and the SEEnior team.

This document was produced to provide the students in the Vision Rehabilitation Programs and all vision professionals basic information on magnification for people with low vision. A reading chart in Arabic can be downloaded at: <http://vr.gju.edu.jo>.



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