

Tips for dispensing spectacles for children

Spectacle frames

Young children do not have a bridge to their nose, so spectacle frames for children must be selected carefully to fit their faces. The characteristics of good children's frames are:¹

A larger frontal angle (Figure 1) i.e., the angle formed by a line parallel to the rim of the frame where it rests on the nose and the perpendicular line dividing the nose in two (viewed from directly in front). Metal frames with pad arms allow the frontal angle to be adjusted.

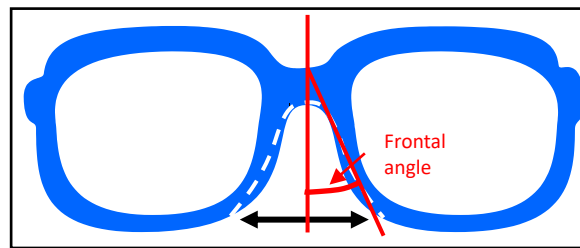


Figure 1. Frontal angle

A larger splay, see Figure 2 (The angle formed by a line parallel to the rim of the frame where it rests on the nose and the perpendicular line dividing the nose in two (viewed from above).) Metal frames with pad arms allow some flexibility in adjusting the splay.

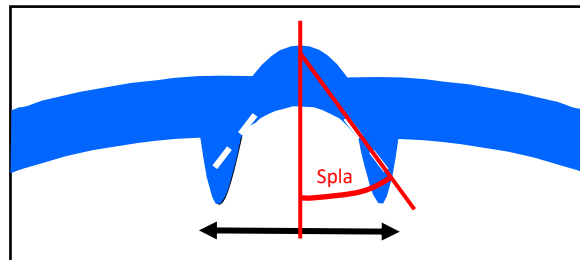


Figure 2. Splay

A flatter pantoscopic angle (Figure 3) (i.e., the angle at the vertical plane between the optical axis of a lens and the visual axis of the eye in the primary position (horizontal)—with the lenses tilted forward).

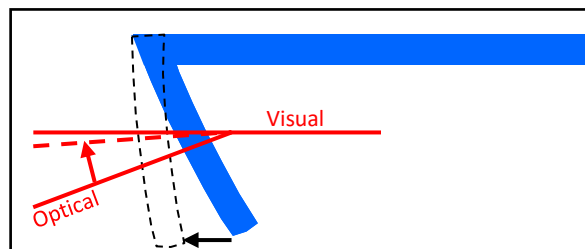


Figure3. Pantoscopic angle

A lower crest (crest height is the distance from the horizontal centreline to the crest of the frame (Figure 4)).

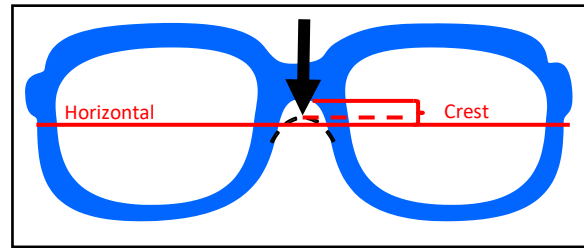


Figure 4. Crest height

Ability to shorten sides (sometimes referred to as temples). The plastic covering the end of the side can be removed, the wire cut to shorten the side, and the plastic refitted.² The angle down (see Figure 5) should not extend beyond the ear lobe.

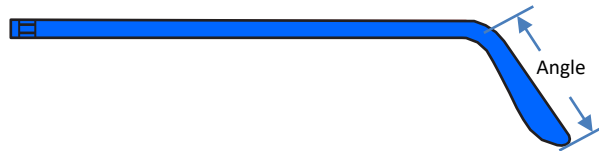


Figure 5. Angle down

Spring hinges. The frame is less likely to go out of adjustment if the child takes the spectacles off with one hand. Also, the frame will absorb some of the impact if hit by an object such as a ball.

In addition to the above characteristics:

- Make sure that the frames have no sharp edges which may cause injury if the frame is struck.
- Match the frame width to the child's face. Avoid choosing a frame that they can "grow into".

A frame that is too wide will be easily knocked off and will result in thicker lenses than necessary. Children are also likely to reject oversized frames.

Lens material

The ideal lens material should be:¹

- Impact resistant – do not use glass lenses. Scratches on lenses reduce impact resistance. Lenses should be replaced regularly or if badly scratched.
- Light and comfortable (all plastic lens materials meet this criterion).
- Able to cut out ultraviolet (while polycarbonate is the most effective material in cutting ultraviolet all plastic lenses perform adequately).
- Relatively thin. If possible higher refractive index plastic materials should be used for higher powers.
- Relatively durable. When coated all plastic materials perform adequately.

The best option for children is polycarbonate. Where this is not available, CR-39 (also known as ADC* or allyl diethyleneglycol carbonate) is an acceptable alternative. Some ready-made spectacles may have acrylic plastic lenses; this is also acceptable.

* This is the preferred term in standards documents³ because it is not proprietary.

Ready-made spectacles

Ready-made spectacles in low to moderate plus powers have been used for many years as a simple means of correcting presbyopia. They are now available in powers from -6.00 D to $+6.00$ D, making them useful for correcting distance refractive errors in children. They are usually available in both metal and plastic frames with plastic lenses.

Ready-made spectacles are suitable for children where:

1. anisometropia (the difference between the two eyes) is less than 0.50 D
2. astigmatism is less than or equal to 0.75 D
3. prescribed prism is less than or equal to $0.5 \Delta^4$
4. the spectacle frames available are of suitable size

Ready-made spectacles should preferably be limited to powers less than or equal to ± 3.50 D with the exception of outreach programs.* If powers outside this range are used then full quality assurance checks should be carried out where possible.⁵

Ready-made spectacles of less than or equal to ± 3.50 D should be checked visually for faults and flaws, notably surface waves.⁵ #

* Delivery of custom-made spectacles back to outreach sites can be difficult, therefore a wider range of ready-made spectacles may be needed for such programs.

Powers of less than or equal to ± 3.50 D are relatively unlikely to fail on criteria requiring measurement by a focimeter. Therefore, focimeter checking for powers within the range -3.50 D to $+3.50$ D is not required; a brief visual inspection will suffice.⁵

Ready-made spectacles should be an appropriate physical fit and be adjusted to suit the wearer by a trained person.

If children are to be prescribed ready-made spectacles they should be of an appropriate size and particular consideration should be made of the PD.

Ready-made spectacles should be cosmetically acceptable.

Ready-made spectacles should be supplied under the guidance of a qualified practitioner, and only when custom-made spectacles are not available or affordable.

Ready-to-fit spectacles

Ready-to-fit spectacles are also available now where spherical lenses of different powers can be clipped into a specially made frame. These provide a solution where the refractive error between the two eyes are not the same as different lenses can be used. However, problems with induced prism due to mismatch of interpupillary distances described above still apply and hence, usage is better limited to prescriptions below 3.50 D. There is also the addition of potential aniseikonic effects if the difference in power between the lenses are too high (> 2.00 D). It is recommended that if both eyes have different prescriptions, that only differences of less than 2.00 D be prescribed between the eyes.

Recycled spectacles

Recycled spectacles are used spectacles donated by members of the public. The International Agency for the Prevention of Blindness (IAPB)⁶ recommended that groups involved in eye care should not accept donations of recycled spectacles nor use them in their programs as “no amount of efficiency and effectiveness in the delivery chain can justify the output and outcome of this recycling scheme.”

Adjustable spectacles

Several types of self-adjusting spectacles are available. However, self-correction involves trial and error and bypasses clinical refraction. Self-refraction can lead to overcorrection of myopia, under correction of hyperopia due to accommodation⁷ and cannot correct astigmatism. Self-adjustment should not be used in school eye health programs unless they are used under the supervision of suitably trained eye care personnel to prevent over- or under-correction of refractive error. The IAPB position paper states that while these type of spectacles may be a solution to correction of refractive error, they should meet optical standards and be supplied only in conjunction with an eye examination by trained eye care personnel. (<https://www.iapb.org/wp-content/uploads/2020/11/Position-Paper-on-Self-Refraction-with-Adjustable-Spectacles.pdf>)

Custom-made spectacles

Custom-made spectacles require access to an edging and fitting workshops and access to uncut spectacle lenses and spectacle frames. They are the ideal solution to refractive error, particularly in cases of significant astigmatism or anisometropia. However, they are more costly since they are more labour intensive and require a production facility.

Spectacle frames

The appearance and comfort of spectacle frames are essential. Children must be comfortable about wearing their spectacles which is assisted by allowing children to choose the frames they prefer from a range of metal and different coloured plastic frames. Gender has also been identified as a perceived barrier in use of spectacles.⁸⁻¹⁰

Prescription of spectacles should be accompanied with health promotion especially with peers, teachers and parents.

References:

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