

**Concept Development**  
with children with a (severe)  
visual impairment

Irma Uijen de Kleijn  
Fenne van den Bos





“Participating in a world you understand”  
Expertise programme Knowledge & Ability  
[www.visio.org/kennen-en-kunnen](http://www.visio.org/kennen-en-kunnen)

Cover photo: Ida van Boekel.

## **Introduction**

How do you explain the concept of a cloud, a tiger, or a high-rise building to a child with a severe visual impairment? With sighted children, this is self-evident: you point it out, read a book about it, or you find a video on YouTube, whereas this requires much more attention with visually impaired children. Within the Visio programme 'Knowledge & Ability', we want all children with a visual impairment to participate in a world that they understand. A sound concept development contributes to that. That is why the Knowledge & Ability programme will be investing in the collection, development, and safeguarding of expertise around this theme for a period of five years.

This booklet is one of its products and will be used during the workshop on the knowledge day organised by Visio, Bartiméus, and the Robert Coppes Foundation on 14 June 2018. It includes a summary for professionals of what the literature published so far offers on concept development with children with a severe visual impairment. A more concise version of the contents can be found on the EduVIP website, under the theme page for parents with young, blind children, category language, concept development.

Should you wish to share something about this theme, or collaborate in the collection, development, and safeguarding of expertise in this area, or if you have questions, then please send an email to [kennenenkunnen@visio.org](mailto:kennenenkunnen@visio.org).

Happy reading!

Irma Uijen de Kleijn, special education generalist  
Fenne van den Bos, programme manager Knowledge & Ability

## 1. What is concept development?

**Teacher:** can you tell me what roof tiles are?

**Pupil:** I don't really know what a house looks like on the outside, and whether there are different types of houses. And about the roof tiles, are these tiles like the ones I can feel in the bathroom?

When we work with visually impaired children, we speak of concept development. Everyone who considers the term "concept development" can understand that we live in a world of concepts, and not in a world that is just made of objects, events, and situations. An object can only get meaning when we receive information on the object from our various senses, and when we can combine these separate parts of information into all-encompassing entity: the concept. The object "water kettle", for example, has not yet a meaning as an object. We add the word to the object, giving it some more meaning. When we know that a water kettle is used to heat water, and when we understand that we can use the heated water to make a cup of tea, our understanding of the object is richer and more complete. When we also held the water kettle in our hands, felt its shape, experienced the difference between the hot and cold water kettle, our understanding of the word becomes even more complete.

**HOT**

**ROUND**

**YOU USE IT TO  
BOIL WATER  
TO MAKE TEA**

**MOST PEOPLE  
HAVE A WATER  
KETTLE**

**SOMETIMES  
IT WHISTLES  
BECAUSE IT  
RELEASES STEAM**

**WOULD YOU  
LIKE A CUP?**



A concept is something that is abstract, a symbol of all knowledge on a certain object, event, or idea. Concepts are generally explained by words, especially when they are abstract terms. You need your senses to learn a language, but this is not enough. It also requires cognition and the ability to learn a language. So to understand a concept, it helps when the experience with the concept can be as rich and extensive as possible. Conceptualisation is a continuous process. The world is a strange place and young children will try to match their experiences to their previous, familiar, and predictable experiences. This is how they understand locations, functions, and typical features. Such understanding starts with something concrete and grows into abstract. A child first feels the concrete characteristics of an object (legs, seat, back rest), then they will learn the function of the object (you can sit on it), after which they learn the general essence or character of an object (it's a piece of furniture). You continuously add information to expand the knowledge, of the object as well as within the social environment (Franco, 1982).

## **2. Why is a sound concept development important for children?**

**Teacher:** can you tell me the name of a type of fish?

**Pupil with visual impairment:** a duck.

**Teacher:** no, that's not a fish.

**Pupil:** but I thought that a duck also swims in the water?

Westby (1991) writes: "To be truly competent in the world, children must be able to do more than repeat a string of facts, and they must understand more than the laws governing the physical world. To exist successfully within the world also requires an understanding of people – how they think and feel, what motivates them, their roles, the relationships among people, and how they maintain these relationships through communication".

Acquiring a basic knowledge of concepts is not just essential to understand instructions given by the teacher at school, but also to develop a good vocabulary, language production, and language comprehension. Knowledge of concepts also depends on intelligence and school performance (Bracken, Panter, 2011). Vocabulary is considered to be a precondition for successful schooling (Verhallen et al., 2001), and an incomplete or incorrect attribution of meaning to words can result in language and educational problems (Schoonen & Verhallen, 1998).

Warren (1994) describes the importance of knowledge on the basic concepts of the normal physical world. An example of this is knowing that an object falls down when you let it drop. A child learns this by seeing it, experiencing it, and based on intelligence. When a child is unable to see these kinds of normal things about the physical world, it will be extremely difficult to adapt (cognitively) in the world. If you have a certain amount of basic understanding, then such things no longer need your attention and you can focus on further development. Basic areas that need to be understood are:

1. Object permanence; knowing that something exists even when it cannot be perceived.
2. Properties of matter; the understanding that proportions such as mass and volume remain the same, even when this seems not to be the case. A tall object often seems to have a larger volume but this is not necessarily the case – this is based on perception.
3. Cause and effect; the understanding that an action will have a consequence.
4. Time; an understanding of the order of events in time, of both fixed time periods like days or weeks, and of the concepts of past, present, and future.
5. Spatial structure; the understanding of space and its structure, and

the spatial position of oneself or an object within an environment which can constantly change. For example, Bob stands in front of Bram. Bram stands in front of Hans. What is Bob's position in relation to Hans? And when Bob is now standing behind Hans, then what is Bram position?

Clinical findings show that problems with understanding concepts can lead to estrangement between children with and without a visual impairment. And to avoid social and interaction problems, we want to ensure a sound concept development.

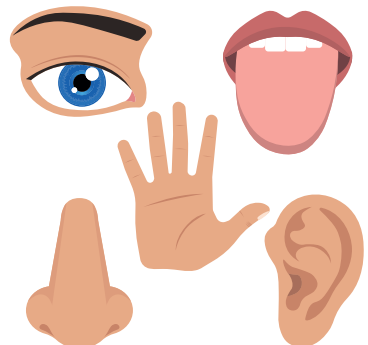
### 3. How does concept development grow with sighted children?

**Teacher:** how far above your head do you think an airplane is flying?

**Blind pupil:** I think about 15 metres, when I'm in the attic, I can still hear the airplane clearly, but I have never been able to touch it.

Sighted children experience a visual environment every waking hour. Long before they are capable of putting information into words and to understand something verbally, they have developed a concept about, e.g., a roof, walls, and the floor of a house because they already explored them visually thousands of time (Franco, 1982).

Withagen (2010) indicates that we construct concepts by perceiving them from our different senses: we acquire insight into the world and how it works. You use all your senses to shape an image of the world around you. By seeing something with our eyes, we get an impression of its shape, size, and colour. Our ears pass on vibrations, sounds,



or echoes that objects produce. With our nose and tongue, we learn how something smells and taste. And by using our hands, we learn more about the shape and size of an object. Not about the colour, but we do feel texture and temperature. Children learn a lot about concepts when their language develops. Information they cannot understand yet can be clarified by the environment, by giving explanations and by watching videos online.

#### **4. How does concept development work with children with a severe visual impairment?**

**Teacher:** how does the garbage end up on the dumpsite?

**Pupil:** I throw it in the bin. **Teacher:** And then, what happens next?

**Pupil:** I don't know.

Blind (or severe visually impaired) children lack a continuous perception. You get a constant input from your environment when you can see. Interaction with the world is crucial for filling in concepts. A new-born baby has no understanding of the physical world; a two-year-old has already gained so much more understanding. This is the result of communication by and with the environment and by direct perception via the senses. The visual impairment leads to a number of restrictions when it comes to elaborating on experiences. Blind children receive information by touch, hearing, smell, and taste. These senses don't offer the same continuous information about the environment like vision does; blind children perceive and experience their world more fragmentarily.

**The child in the example may have smelled a garbage truck at some point, and possibly helped to put the garbage bag into the bin. But it may not be possible to link these fragmented perceptions by language or by literally following the route that the garbage travels. They remain separate fragments.**



Apart from that, these children have significantly less opportunities to explore the world independently (Franco, 1982). They miss out on many spontaneous learning moments, so they need consciously given instructions about the environment. It takes a lot more time to get adequate experiences that are needed to understand concepts. The experiences are also more limited because visually impaired children clearly need more time to explore their environment actively.

By dealing with objects and people actively, children develop an understanding of concepts. What simply starts with a sequence (when I say “hello”, the other person also says “hello”), grows into more internal representations (showing an interest in another person can result in friendships). As soon as children get fewer experiences, the basis to elaborate on experiences decreases. From a sighted perspective, this can lead to more limited, incomplete, or dysfunctional information.

Visually impaired children may not come across words that are used in many contexts, so their vocabulary (embedding of the lexical network) is less extensive (Tellings). Children who learn to read, for example, see words and letters that they recognise all around them. You hardly ever come across braille words spontaneously. You learn words by perception and experience, through language or via a combination of this. As a result of small misconceptions, children can create a deviant image of the world. In turn, this can lead to wrong conclusions (Echolalia).

**Like the example of a blind child having an image of a bird having four legs and sitting on a branch on its buttocks.**



The child knows and recognises parts of a concept, but not yet everything (Linders). Furthermore, because of the visual impairment, there

are fewer ways to check whether their perception is correct. This way, information can be misunderstood or misinterpreted, and concepts may be understood incorrectly, incompletely, or with little differentiation (Franco, 1982). Research conducted by Marloes Baars shows that, on the surface, the understanding of words seems to be good because they are used correctly and in correct sentences. However, when inquiring further, it appears that the full meaning is not always known. Children with a visual impairment generally have no problem labelling to referents (objects, actions, or situations words refer to). The extension of their vocabulary is good. The more difficult part is the depth of their vocabulary. Their knowledge is less precise, less extensively used, and less embedded. This can result in making mistakes when it comes to semantics (the meaning of words) and in the pragmatism (use of language in social interaction) (Linders, 1998).

## **5. What are the difficulties in teaching concepts with visually impaired children?**

Withagen (2010) indicates that blind children need extra attention and support when it comes to learning about the world around them, and as words often have multiple meanings, expanding this knowledge only through language can be misleading.

Take, for example, the concept of swimming. A person swims with his body under water and his head above water. Fish swim entirely under water. Ducks swim, float basically, even though we call it swimming. A ship that floats, or a sinking ship, is not described as swimming.



Sighted children usually find this kind of information automatically because they can see such things from a distance or on films or pictures. They gain a lot of implied experiences without direct instructions or targeted focus. The casual character of acquiring information also ensures that it takes little effort.



Blind children will have to gain and expand their knowledge about concepts by gaining experiences on a concept through all the senses that can be used for that. This way, they can enrich a concept and make it as complete as possible. Gringhuis (1996) describes that not everything can be easily experienced and that seeing something is an incentive to act; children act because they are enticed to do so by what they see.

Vision gives information about the environment and triggers a child to start exploring. This trigger will have to be offered more explicitly and up close with blind children. Sight is a remote sense and gives information about the more distant world which is shown in an integrated manner. Without this input, the child can only rely on verbal descriptions that are subjective and often incomplete. Apart from that, not every visual image can be captured in verbal descriptions or tactual experiences. This can partly be compensated via language and other senses; it is, however, difficult to match the quality of the visual information. Building up structures requires more attention.

- It can be more difficult to make relationships between cause and effect. Distant information can be missed (like a fight in the school yard), which can result in not understanding the consequences (disciplined classmates).
- For visually impaired children it is harder to order categories. It is important that they can super- and supraordinate: children learn that an apple is a type of fruit, but so is an orange. And that Granny Smith and Braeburn are different types of apples and not part of the “types of oranges”.
- The behavioural repertoire is often less varied. They learn, for example, that you shake someone’s hand when you meet a person. A blind child will not notice other behaviours that people use during a meeting ritual, like a nod, a smile, a hug, or alternative hand gestures.
- Children can misinterpret situations because they lack information.
- Concepts can be incomplete, leading to incomprehension. For example, a child that didn’t know that a teabag needs to go into the hot water to make tea.

There is a continuous vertical expansion of words. Long after you heard a word for the first time, elements and meanings of the words are added in different capacities. This process continues until the full meaning is integrated. The child creates a network of symbols and the association between these words (horizontal expansion) in the long-term memory. When touching an object, the concept is placed into the network at the location where it belongs.

For visually impaired children, this expansion is less self-evident and it is difficult for them to build up a frame of reference. This is not always done systematically.

Piaget describes the importance of interaction with the environment and how this interaction depends on vision. How we learn is often based on direct observations. There is a difference between knowing that some things are not the same and why they are not the same. For the latter aspect, it is necessary to understand causality. Causality happens by experiencing something, but also by seeing cause and effect from a distance, also when the child is not involved him/herself. Vision leads to expectations. An object that moves from left to right and disappears behind a screen, is expected to reappear at the right side of screen and not somewhere else. There are, however, lots of other examples whereby cause and effect remain difficult for sighted children as well, such as gravity. You know that an object falls down, but it not always clear why.

Visually impaired children are limited in their observations. Acquired information is more often incomplete and less exclusive. The close-by concepts, concepts about objects, events and situations you can feel, hear, or which are easy to experience personally, are generally relatively easy to fill. Even so, it appears that a concept may have seemed to be filled while this is not the case. Words have multiple



meanings and objects can have different appearances. Cups, for instance, come in all shapes and sizes. That is why generalising concepts and the familiarisation of categories and subcategories by the child needs extra attention. It takes a lot of time to get a child acquainted with all these appearances. The far-away words, words for concepts

that you cannot see, feel, or experience because they are too far away (cloud, moon), too large to be felt or experienced by a single touch (house, submarine), too small (cell, a speck of dust), not easily touchable (soap bubble, insect), or dangerous (fire, lion, tiger, and many other animals), are the most difficult to explain. Abstract word knowledge (tide, idea, because) is often acquired by using language, making it possible to explain things (Withagen). You don't need to have seen everything to understand it (Gringhuis).

Concept development and learning a language starts with understanding the meaning of words. Deictic terms, like personal pronouns, reference words, and adverbs indicating location, are difficult because these terms rely on the ability of the listener to localise objects from the position of the speaker – "I-you, here, this, that, there-here". It becomes even more difficult when the context of the conversation changes, for instance, when there are multiple speakers present and the "he" in the conversation suddenly become the "I".

Clara Linders (1998) explains that words which can only be predominantly learned through visual perception in order to understand the all-encompassing concept of the word, will be difficult to understand for visually impaired children. Words that are problematic, are the ones for objects and situations that cannot be touched, smelled, heard, or experienced (in a single action, entirely). Think about words like cloud, lion, skyscraper, etc. Words for objects that can be touched (pencil), felt (warm, cold), or which you can experience (walking) are easy to understand.

As already described, it is hard for children to learn concepts. It also requires a lot of effort from the parents. Parents of sighted children find implied experiences commonplace and they will adjust the language they offer accordingly. They explain and put to words what

happens. Yet, parents (and others in the child's immediate environment) do this in many different ways, which are particularly determined by socioeconomic factors, personality, and intelligence. The sighted parent is often not aware of the fact that the visually impaired or blind child needs more interpretation and explanation, and have experiences that fit in with the sensory experiences that are still possible. By doing that, the offered experiences also instantly become more explicit.

**The knowledge of a young visually impaired about the potatoes that are eaten is often limited to 'warm', 'peeled', and 'crumbly'. By bringing the child to a potato farmer, letting it take a potato out of the ground, and by peeling the potato together, the child feels the difference and learns to recognise a potato also when it is uncooked or fried.**

This requires empathy and creativity from the parent, but most of all a large conscious focus on the language and how it is offered. Parents are asked to act less on intuition and to explore the world more based on common sense. Achieving a sound concept development requires a lot of energy from both the parents and the child.

## **6. How do visually impaired children benefit from a sound concept development?**

Blind children tend to use a lot of words and they also use language that is based on visual experiences they never had (verbalism) and which is, therefore, often not fully understood. By gaining more knowledge about concepts, less empty language is used. No matter how frustrating it can be, the ability to create some understanding of the meaning of concepts is essential to integrate successfully in the sighted world (Franco). By expanding conceptual understanding, the child reaches a certain level of "intelligence" (Piaget).

At the cluster 1 schools, the Cito-tests show a lower score on reading comprehension than at regular schools, and the ability to turn sounds into words is also developed more slowly. A sound or early concept development, starting at a young age, may improve the understanding of language and word knowledge (Baars).

## **7. What are the different methods?**

An inventory of the used methods to teach concepts within Visio demonstrates that basically no other methods are used apart from the methods that teach concepts by touch (Tactual Profile, Feel Free, In Touch) and methods for science subjects at school, understanding of sexuality (Zo Zit Dat, only in dutch), the experience database, and several theme boxes (self-knowledge, socioemotional development). An international inventory learns that there are some methods and materials available for subareas. For example, the materials developed by Bob Marek for teaching geometrical figures and the conversion from 3D to 2D; World Explorers and "De Weg der Dingen" (Spermalie) to gain everyday experiences to compensate for missing out on incidental learning. From the MOOC (outlined from Knowledge & Ability 2018), it appears that little is known when it comes to methods focusing on concept development. On the other hand, teaching concepts to children with a severe visual impairment is universally considered to be very important. Warren (1994) describes that a learning environment increases the cognitive abilities. Training programmes aimed at acquiring and learning concepts, and at stimulating and manipulating the environment show successes. It is clear that concepts are not filled automatically or naturally. It requires a lot of effort from the visually impaired child as well as from the parents and the social network of the child to achieve a sound conceptualisation. Visio staff members could be more



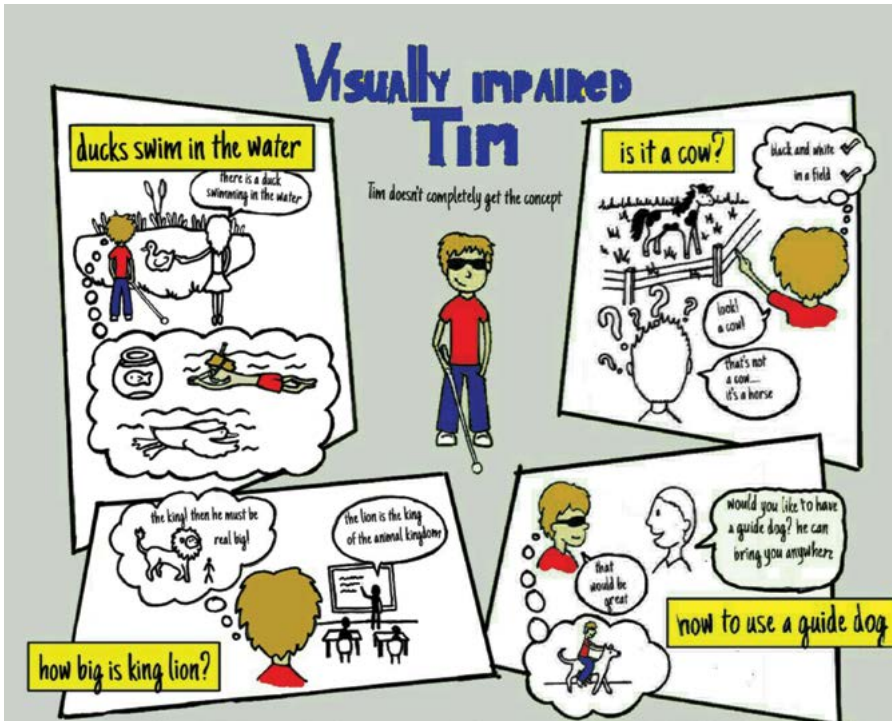
supported in this aspect when they know precisely which concepts are difficult to learn, and by having access to methods that support the concept development. This is what the Knowledge & Ability programme is currently working on.

## **8. Which tips can be given to increase the concept development with visually impaired children**

- The options to learn concepts properly can be increased by the approaching the environment actively and by making activities interesting and meaningful from the viewpoint of the visually impaired child. Under normal circumstances, adults wait for the initiative coming from the child before they offer new experiences. Children with a severe visual impairment often don't show this initiative or the signs are subtle and difficult to read. Within the support group, getting better insight into these signs is an important focal point.
- Visually impaired children depend more heavily on language in order to be able to use their environment. This creates a way to offer interactive information about the environment. It is crucial to keep the language that is used close to the child's experience and to expand the information about a certain subject based on this experience. When the child experiences a tree, you can let the child feel and experience the trunk, leaves, branches, roots, after which you can go to a forest together and feel different trees and explain what a forest is. After that, you can tell the child about leaves falling from the trees, etc. It is important to follow a system, build it up logically, so the child can comprehend everything. Afterwards, you can let the child feel a miniature tree, glue leaves on a piece of paper and, later on, make a drawing on tactile paper so that the child experiences the tree two-dimensionally. And, of course, don't forget to involve the other senses like smelling, feeling, listening as

well, and let the child experience bodily how it feels to stand and sit on, and walk across or climb over a fallen tree.

- Most of all, give the child time to experience and repeat activities. When you are too consciously focusing on the learning aspect, the child will not get the space to be creative and learn how to handle activities flexibly.
- Let children experience different types of a certain concept. There are, for example, lots of different chairs, cups, buses, trains. Describe the common properties together and look for the features that are always the same.



## Bibliography

- **Baars, M. (2010).** Diepere woordkennis en slechtziendheid. De invloed van slechtziendheid op de diepere woordkennis van kinderen in de basisschoolleeftijd. Masterscriptie.
- **Bracken, B.A., Panter, J.E. (2011).** Psychology in the schools, vol 48 (5), 2011
- **Franco, K. (1982)** Concept formation and development in the congenitally blind child. Honors Theses.
- **Gringhuis, D. Moonen, J., Woudenberg van, P. (1996).** Kinderen die slecht zien. Ontwikkeling, opvoeding, onderwijs en hulpverlening.
- **Linders, (1998).** Zweeftaal en andere raadsels in het woordbegrip van blinde kinderen.
- **Piaget, J. (1962).** Play, dreams, and imitation in childhood. New York: Norton.
- **Recchia, S.L. (1997).** Play and concept development in infants and young children with severe visual impairments: a constructivist view. American foundation for the blind; JvIB.
- **Schoonen, R., & Verhallen, M. (1998).** Kennis van woorden: de toetsing van diepe woordkennis. Pedagogische Studiën, 75(3), 153-168.
- **Tellings, A. (2017).** Hoe kinderen woorden leren. Garant
- **Verhallen, M., Schoonen, R., Appel, R. (2001).** Verdiepen van woordkennis: een empirische studie naar de effecten van een trainingsprogramma. Pedagogische Studiën, 78 (4), 239-255
- **Warren (1994).** Blindness and children. An individual difference approach. Cambridge University press.
- **Withagen, Betten, A., Blok, A., Buurmeijer, A., Heins, L., Mul, M., Oosterlaak, L., Withagen, A. (2010).** FanTASTisch. Een inspiratiebron voor ouders van blinde kinderen. Visio, Huizen
- **Westby, C.E. (1991).** A scale for assessing children's pretend play. In S.E. Scheafer & K. Gitlin Sungrund (Eds.), Play diagnosis and assessment (p. 131-161). New York: Wiley.

**Royal Dutch Visio**  
centre of expertise  
for visually impaired  
and blind people

**[www.visio.org](http://www.visio.org)**

This booklet on concept development is a publication of the expertise programme Knowledge & Ability of Royal Dutch Visio. It includes a summary for professionals of what the literature published so far offers on concept development with children with a severe visual impairment. Should you wish to share something about this theme, or collaborate in the collection, development, and safeguarding of expertise in this area, or if you have questions, then please send an email to [kennenenkunnen@visio.org](mailto:kennenenkunnen@visio.org).