Tiny People, Tiny Footprint

On rewilding a landscape by including children

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Introduction

The sounds of cars driving, busy streets, high buildings, the smell of food and the sight of shopping centres, this is what many people in the Netherlands experience in everyday life. Cities can be exciting and offer many opportunities for citizens. However, cities' landscapes often do not offer much space for nature. As more people are living in urban areas due to these opportunities and conveniences, also more people are becoming distant from nature: the human connection with nature is deteriorating. Being in nature has many benefits and can incentivize people to care for their natural environments (Barrable and Booth 2020). Hence, it is important that people realize the importance of nature and experience the mental and physical benefits of it.

The Wild Lands, initiated by Lideweij Bosman is a project which is looking to combine nature conservation and recreation. The idea is to buy a piece of land which is going to be for nature conservation, but the land is also going to be a place for people to reconnect with nature. However, instead of just looking at how to make the land attractive for people who already have great interest in nature, we focused on connecting children who have less access to green spaces with the Wild Lands. We particularly elaborated on bringing children to the area, as creating nature connectedness early on has the most lasting impact on having nature connectedness in the rest of their lives and influences their decisions on wanting to learn more about the environment. In addition, it is highly important that recreation does not disturb nature conservation efforts. Therefore, we researched how rewilding and conservation management can be done best in combination with bringing children to the area. We will offer several recommendations on this.

Thus, our project has two goals: **rewilding** and **connecting**. We researched both aspects as this offers a holistic perspective on how the lands can be both used for children recreation and nature conservation. In this report we will firstly discuss the importance of connecting children with nature and discuss the nature gap. Secondly, we will share our research process and data. Thirdly, we will propose our recommendations on the best methods for arranging the land and on how to connect children with the Wild Lands. Lastly, we will give our conclusion and discuss some limitations of doing the research.

Literature review

The importance of connecting children with nature

In the 20th century many lifestyle changes have occurred. One of these changes is that people generally spend more time indoors than outdoors. The connection with nature has deteriorated for many people living in cities, but particularly this connection has lessened among children. Nature connectedness is a subjective state that encompasses cognitive and experiential elements. It is associated with wellbeing and creating pro-environmental stances and behaviours (Barrable and Booth, 2020, *figure 1*). It is argued that nature connectedness is seen as a stronger predictor of ecological behaviours in children than environmental knowledge (Otto and Pensini, 2017). Hence, nature connectedness is often a distinct goal for children's environmental education (Otto and Pensini, 2017). Research has been done on which ages respond best to increase nature connectedness, but this is difficult to generalize. However, when younger children are more connected and interested in nature, this can highly influence their future interest in nature as well. Thus, there is an indication that changes in nature connectedness in younger children are more likely to be permanent compared to older children (Barrable and Booth, 2020).

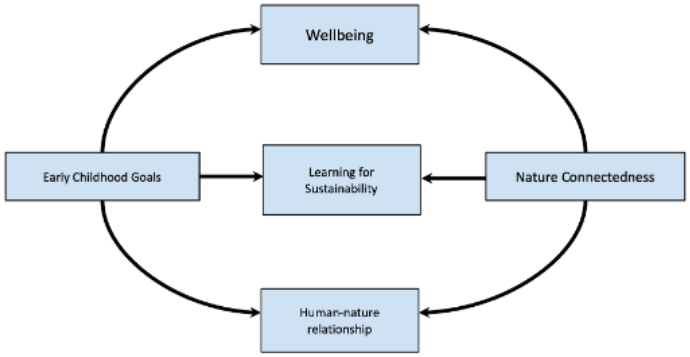


Figure 1. Relationship between Early Childhood Goals and Nature Connectedness.

Figure 1. Relation between Early Childhood Goals and Nature Connectedness (Barrable and Booth, 2020)

In several studies the participants with lower nature connection during pre-testing seemed to have the most gain in nature connectedness (Barrable and Booth, 2020). Furthermore, researchers have argued that the time spent in nature during childhood is the largest predictor of emotional affinity towards the natural environment (Barrable and Booth, 2020). Nature connectedness can be created in different ways. Most scholars argue that this can be done not necessarily only through knowledge, but also through emotion, sustained contact, beauty and fun (Lumber et al., 2017). More emphasis could be placed on measuring alternative activities that bring children in sustained or impactful contact with nature, such as forest schools, nature kindergartens, adventure activities, and wildlife expeditions.

Having more nature connectedness has many benefits. One research emphasizes on how it can increase happiness (Hernandez et al., 2020). The research showed how children who viewed themselves as more connected to nature tended to act more sustainable. More importantly, the study showed how the more pro-ecological the children were, the greater their perceived happiness was (Hernandez et al., 2020).

A previous project of a Wageningen University and Research (WUR) student focused on children in permaculture (Van Neste, 2019). Children were asked to create their own forest garden by answering interview questions and drawing their ideas. The results showed that children mainly wanted to create fun spaces, highlighting that this is where most learning

happens. Furthermore, caring for animals and harvesting/preparing food from the forest garden were expressed as desired activities. Children also illustrated that they like lots of water and value a central space in the garden. Van Neste (2019, p. 1) states “Forest gardens meant for educational purposes should put aside specific learning structures in favour of providing a space that enables children to make connections without feeling obliged to participate.” A forest garden can give children the opportunity to have fun, see food in a different way, and inspire them to see themselves and their teachers, peers in a new way.

The Natural Start Alliance (Geczi, 2019) highlights similar aspects of making nature exciting for children and increasing nature connectedness. To make a school trip to nature successful they outlined several tips:

- Explore and discover the world of nature on their own terms.
- Engage in hands-on experimentation, and problem-solving.
- Learn how to care for other living things.

They argue that a successful field trip should provide many opportunities for joyful interactions with nature and where children create a desire to learn more about the world and help them develop an understanding of the environment which they are part of. Furthermore, the activities and schedule should be developmentally appropriate for young children.

Nature Gap

What is the relation between less economically privileged children and less nature connectedness? Several news articles argue that there is a phenomenon called the “nature gap”. This refers to the underexposure of low-income families to nature and green spaces (Rowland-Shea and Doshi, 2020). Recent research has indicated that little exposure to nature and green spaces can have serious psychological and physical impacts (Strife and Downey, 2009). Children in particular suffer long-term developmental consequences of little experiences with nature. In the United States several researchers argue that white people live in places with often more immediate access to nature than people of colour do (Borunda 2020). Furthermore, the Hispanic Access Foundation and the Center for American Progress, state that people of colour often have no access to green spaces, paths, and parks. In addition, several scholars argue that children living in highly urbanized areas can develop feelings of isolation from nature and start to dislike it. This can potentially influence their future decisions on environmental protection and their stance on sustainability. Thus, children who have more exposure to nature are more likely as an adult to feel sentiment towards nature and engage with practices that protect the environment (Strife and Downey, 2009). The report published by “Kennisplatform Integratie en Samenleving” (Knowledge Platform Integration and Society) reveals the living conditions of children with a migration background in the Netherlands (Tierolf et al., 2017). The authors argue that children with a migration background often live in worse living conditions and in bad neighbourhoods. However, the topic of nature accessibility, green spaces and the relation between poverty has not been addressed in this report.

Thus, there has been research on income and colour-based environmental inequality regarding green spaces and nature connectedness in the United States, but further research on this topic should be conducted in the Netherlands.

The process/research

Conservation

Rewilding and farming for the recreational area

The process of rewilding is a complex process consisting of different concepts that can be adapted. Rewilding needs to be approached from a theoretical, functional as well as a more practical approach. Considering that the recreational area we want to create also contains an area for farming, we want to introduce some approaches that will help the process. We explain why the Holistic Management process can be helpful for farming and rewilding and the usefulness of applying permaculture principles to the landscape design, which will help create the perfect recreational area.

The Holistic Management Process

When it comes to farming it's important to take into account all aspects, from the land that will be used, territory you are in (taking into account the fact that some countries have a predominantly specific climate), to the funding you have and the needs you have. It's important to organize everything and take in consideration all aspects, as perhaps to keep it as natural as possible, trying to conserve what nature offers, for this we can use the holistic management process.

Holistic management is a process from which anyone using it can profit from agriculture, conserve natural resources, and end up having more time to enjoy a high-quality life (Sullivan, 2001). Holistic Management Process means that the resources are in whole units, in this way, the description is clear of what is being managed and people start defining their whole. A detailed holistic goal is developed after a listing of all the decision-makers involved in management, the resources they will be working with and the money available (Sullivan, 2001). The holistic goal brings together a values-based quality of life, a listing of forms of production that ensures a better life, but most importantly it offers an idea of how the land should look in time in order to be sustainable (Sullivan, 2001).

When it comes to holistic managers use, in order for the entire project to work properly, we believe that it would be a great idea to have ensured a profit per year to make sure that all costs are covered (see in logistics). That is the reason why we believe the holistic approach is suitable, taking into account that the plan has to be made in such a way that there is a profit at the end of the year. A potent financial planning, in which decisions are made that are good for the environment, the local community and the bottom line, is needed (Sullivan, 2001). A way of doing this is by using a holistic financial plan. The holistic financial plan offers people the possibility to look through their financial year, to make sure that at the end of the year there will be profit (Sullivan, 2001). Financial planning also offers the possibility for managers to select some of their enterprises, so they do not conflict with their values, which are important (Sullivan, 2001). "With holistic financial planning the projected income is planned, then the desired profit is allocated at the outset, heavily affecting how the remainder of the budget will be allocated. Planning a hefty profit before any expenses are allocated is a key distinction.

After profit is planned, expenses are allocated into three categories: Wealth generating, Inescapable, and Maintenance" (Sullivan, 2001).

Permaculture principles

When it comes to designing a system that has to integrate recreation and nature conservation, permaculture principles can be helpful in giving the landscape shape. Permaculture principles take many aspects into account and try to link these aspects as much as possible. Permaculture is a way of designing a system where sustainable and resilient human environments are created where there are a harmonious integration of landscape and people. Observing natural systems, the wisdom of traditional farming systems and modern scientific and technological knowledge play an important role in creating these systems (Mollison, 1991). As Bill Mollison, founder of the Permaculture movement, said: "Permaculture is a philosophy of working with, rather than against nature; of protracted and thoughtful observation rather than protracted and thoughtless labour; and of looking at plants and animals in all their functions, rather than treating any area as a single product system". Permaculture principles stem from 3 ethics: Care for the planet, care for people and fair share. Fair share means taking what you need and sharing what you don't, at the same time recognising that there are limits to how much we can give and how much we can take. Fair share also involves returning surplus to the system. Out of these 3 ethics 12 different principles arise, see *figure 2*.

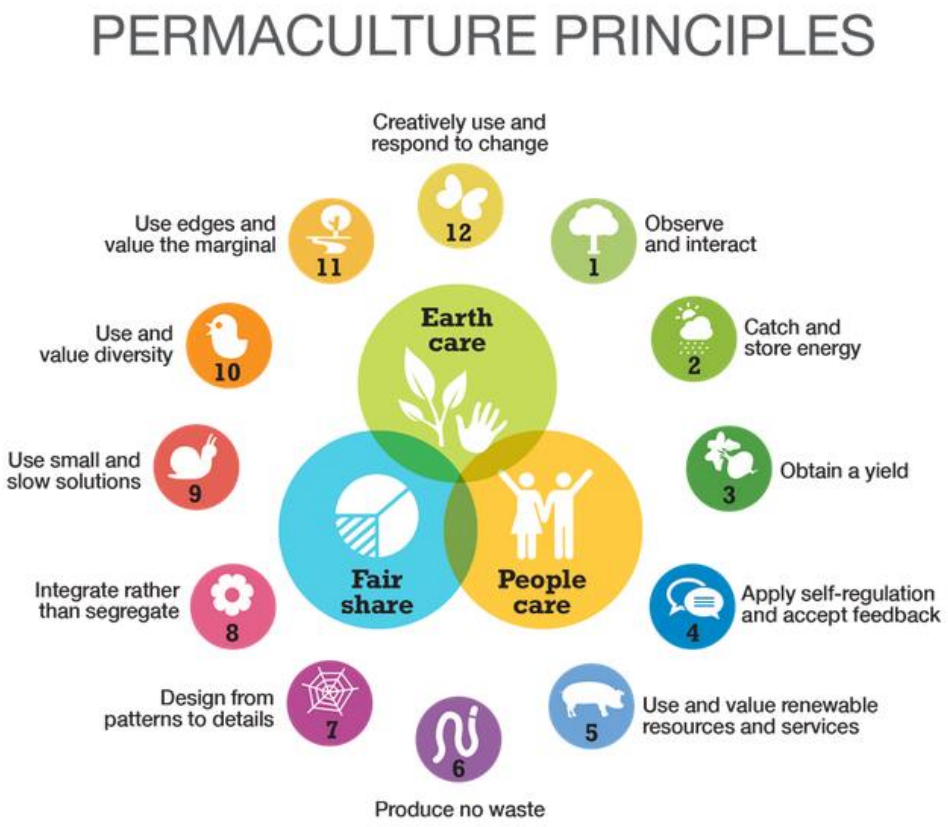


Figure 2. Permaculture principles

Mollison (1991) focuses on 9 principles which are explained here:

1. Relative location: every element is placed in relationship to another so that they assist each other.
2. Each element performs many functions.
   (Elements are things such as paths, a chicken coop, pastures, trees, ponds, playgrounds, animals etc. Examples of functions are the function of food / fodder supply, water supply, energy supply transport etc. including all ecosystems you can think of.)
3. Each important function is supported by many elements.
4. Efficient energy planning for house and settlement.
5. Emphasis on the use of local and biological resources and intrinsic characteristics of animals and plants.
6. Nutrient, energy and water recycling: catch, store & use.
7. Small scale instead of large sale.
8. Using and accelerating natural plant succession to establish favourable sites and soils.
9. Polyculture and diversity of beneficial species for a productive, interactive system. Use guilds (mutual cooperation) and intrinsic behavior.
10. Edges, boundaries, and margins: there you find life!

These principles can and usually need to be integrated into different levels. You can use these principles for example in designing the food forest and designing activities for children, but also on a larger scale like arranging the landscape or when choosing partners to work with. Take for example the principle about observing and interacting, it is important to observe the different elements and how they interact and influence each other before and after making changes. Being observant and responding to what we see is essential in moving towards a more ethical and sustainable way of life. Or take for example the principle 'integrate rather than segregate', focused on how plants as well as people work well in diverse systems. Such as planting polycultures over monocultures and working with guilds in the food forest. This principle can just as well be applied to communities, groups or organisations. Sustainability is something we achieve together, through collaboration and cooperation (Waddington, 2021).

The Wild Lands will be a multifunctional mosaic landscape which includes food forest(s), which is a type of agroforestry. Including the existing 'rabatbossen' (often on country estates) and so-called 'toekbossen'. The 'rabatbossen' and 'toekbossen' have to do with the IJsselvallei Master Plan. 'Rabatbossen' have traditionally been a method for forestry operations in wet conditions with a system of ditches and dikes and to accommodate different tree species next to each other (Bureau Peter de Ruyter, 2021). The 9 permaculture principles could be useful when giving the food forests and other types of forests shape in a sustainable way.

Recreation

This section explores ways to connect children with nature. Even though we solely focus on primary school children, we wanted to create a more fitted outcome. Since children in primary school are developing themselves rapidly, their interests may change quickly. Hence, we have decided to create two focus groups:

- 5–8-year-old (2nd - 5th grade)
- 9–12-year-old (6th - 8th grade)

How to connect children with nature

“Children are born eager to learn. Curious by nature, you can’t keep them from exploring as they try to comprehend their environment. Everything is a wonder” (Stephens, 2007, p. 1). Therefore, we tried to include activities that embrace curiosity and knowledge among other things. In addition to the age group, we divided these activities according to activity theme, sort of activity and the value or skill behind each activity.

For younger children we suggested activities that motivate roaming and exploring the environment around, such as barefoot walking, searching for insects. For older kids we tried to focus more on the learning activities such as recycling and water filtration in an interactive way so that they obtain required skills and have a better understanding about sustainability.

We then sorted the activities according to their main theme to categories like land, plants, animals, and water based on the main environment of the activity. In addition, we separated the individual activities in which a child does these kinds of activities on their own, and the group activities, which are done by cooperating with other children. Last and most importantly we thought of the main values or skills that children can acquire after having such activities and then gathered all these activities into two tables based on the age group.

Activities for 5-8 year old children

Age Group: 5-8 years old			
Activity theme	**Individually or in groups**	**Activity**	**Value/Skill**
Land	Individual activities	Barefoot walking	Sensory development & connectedness to nature
		Painting (art show)	Creativity
	Group activities	Walking tour	Connectedness to nature
		Hide & seek	Self-reliance & critical thinking
		Treasure Hunt	Problem solving & teamwork skills
		Collecting rocks and creating a nice shape	Creativity & teamwork skills
		Collecting rocks and painting	
		Playground activities	Independency, motor & social skills
		Bonfire (storytelling, dancing, marshmallows & games)	Creativity & social skills
Plants	Individual activities	Plant & adopt a tree	Connectedness to nature
		Water the plants	Responsibility
	Group activities	Food forest tour	Curiosity
Animals	Individual activities	Feeding the animals & engaging with them	Responsibility & caring
	Group activities	Find worms/butterflies/insects	Curiosity
Water	Group activities	Water games	Motor & social skills

Table 1. Activities for 5-8-year-olds

Activities for 9-12 year old children

Age Group: (9-12) years old			
Activity theme	**Individually or in groups**	**Activity**	**Value/Skill**
Land	Individual activities	Tree climbing	Sensory development & Connectedness to nature
		Painting	Creativity
	Group activities	Walking tour	Connectedness to nature
		Catch the flag	Teamwork & critical thinking
		Treasure Hunt	Problem solving & teamwork skills
		Collecting rocks and creating a nice shape	Creativity & teamwork skills
		Collecting rocks and painting	
		Recycling game	Connectedness to nature
		Making huts/tents	Problem solving & teamwork
		Playground activities	Independency, motor & social skills
		Bonfire (storytelling, dancing, marshmallows & games)	Creativity & social skills
		Card & board games	Problem solving & social skills
		Trivia games	Critical Thinking

Plants	Individual activities	Plant & adopt a tree	Connectedness to nature
		Plant a seed and take it home	Responsibility
		Water the plants	
	Group activities	Food forest tour	Curiosity
Animals	individual activities	Feeding the animals & engaging with them	Responsibility & Caring
	Group activities	Find worms/butterflies/insects	Curiosity
		Beekeeping	
Water	Group activities	Water games (e.g., making little boats for boat race)	Motor & social skills
		Water filtration game	Curiosity

Table 2. Activities for 9-12-year-olds

Elaboration on the activities:

- *Barefoot walking*: In this activity we let the kids walk around the place freely or in paths without shoes, in order to connect more with nature.

- *Painting* (with non-toxic nature friendly paint): We ask the kids to draw something they like from the nature around them. This can make children more aware of their surroundings and stimulates children to analyse the natural environment.

- *Walking tour*: The guides take the kids in small groups and show them the area with some interesting facts about the area and the nature around it. Facts about plants, trees, how to grow them and take care of them, but also to know important facts about them. Mushroom facts, soil facts and most importantly, animal facts, short but simple to make it easy for the kids to remember.

- *Treasure hunt*: The guides hide a valuable object or objects for the kids (by asking them beforehand what the most valuable object is for each one). Then they divide the kids into groups depending on the number of kids and ask the kids to provide a group name. After that they provide the kids a map to look for clues, and they can provide a fun fact about nature with each clue. At the end of the game the winning group gets the objects inside the hidden treasure.

- *Collecting rocks activities*: The guides ask the kids in groups to collect rocks from the area around them and then create a nice shape of their choice or paint the rocks and draw on them animals or plants that they like.

- *Playground activities*: The kids can have the opportunity to get some time for themselves to play around in the area or with the flying fox or perhaps some climbing activities in trees that are safe.

- *Bonfire activities*: The guides start by letting the kids collect wood for the fire and then the guides can teach the kids to light the fire by observing. Afterwards, activities like marshmallow eating, singing together and dancing can take place in addition to activities like storytelling where the kids can get creative and tell stories from their imagination, or tell stories about special moments in their life to connect with each other.

- *Plant and adopt a tree*: Especially in the first stages of the project, we can let the kids plant and name these trees themselves.

- *Recycling game*: In this activity the guides let the kids put their waste in the right place in a competition way so they can learn how to separate their waste. The competition will be in teams and the fastest to organize the waste in the correct way, will get the prize of flying in the fox once more.

- *Filtration game*: The kids can learn about water filtration and do some simple filtration so they can see how it happens in nature but on a small scale.

- *Making huts/tents*: Kids love building things, and with this activity they get to make their own “house” which is exciting for them. They can learn how to cooperate with others because they will do this in groups.

- *Planting seeds and taking them home*: By that, children can have something from nature to take care of, which can teach them about responsibility, and they can see the stages of a plant's life.

A goody bag to take home

Children are always excited about a trip; we believe that every trip in which children have fun and at the same time learn something new is always a great idea. Having something to remember their good time, new skills and maybe and new interest of theirs by sounds amazing to us, so in this case, we thought that before they leave they should take with them their drawings of “something new they learned” in a frame with a stamp with our logo and a bag of seeds of a plant they learned about during their trip and really liked.

What children want

In order to make the children’s experience with nature more memorable, we investigated what kind of activities connected to nature/outside they enjoy and would like to engage in. We did this by asking the children of primary school De Expeditie, where our commissioner already had connections, to draw what they liked about nature and being outside and what their perfect

school trip would look like. The results of these exercises can be found in Annex 1 and 2 and we elaborate on them in the sections “Aged 5-8” and “Aged 9-12”. We also wanted to create more insight in the likings of less privileged children. Hence, we asked 7- and 8-year-olds of the Islamic Elementary School Yunus Emre in the Schilderswijk the Hague the same question. These results can be found in Annex 3 and are elaborated on in section “Children attending school in a less privileged neighbourhood (7- and 8-year-old)”.

Aged 5-8

For this group, we got 32 drawings. Looking at the first group’s drawings, we see that there is a lot in common. The children mainly want to play, explore and be creative with the space and materials around them. *Table 3* gives an overview of the things drawn by the children and the amount of drawings a topic is represented in.

Tree house	Flowers/fruit forest	Skelters	Jumping	Playing together	Slides	Climbing (in trees)	Swings
12	*7*	*4*	*4*	*9*	*17*	*17*	*4*
Crafting	Playground equipment	Animals	Sport	Relaxing	Earth (sand)	Water (playground)	Else
1	*3*	*1*	*3*	*6*	*11*	*9*	*3*

Table 3. Outcome drawings 5-8-year-olds (Expeditie)

As we can conclude from this table, children that are aged 5–8-year-old are mostly interested in slides and climbing activities (such as climbing in trees and from tree to tree using obstacles like car tires, nets, and rope bridges). Playing in some kind of cabin, whether this is a hut, tent or tree house, scores really high as well. As far as we can conclude from the drawings this is especially the case when the children can participate in the building process. The last thing that has a score of above 10 is earth and sand. With this, we combine several activities that relate to earth and sand, namely: playing in a sand pit, having an underground tunnel system (with the possibility of a “haunted” tunnel), and slides that end underground. All in all, one can say that these children like exploring in the horizontal but especially the vertical dimension.

Aged 9-12

From the age group 9-12 we got 15 drawings. Remarkable compared to the drawings of the younger age group, is that these children seem less creative about possible activities that nature can offer. They mainly focus on activities they are familiar with and that can be found on a playground. Although they are less hands on, they have elaborated more on water activities. Hence, we have decided to split these activities into swimming and other activities (such as using a raft, steppingstones, and a water circuit with locks and pumps). The complete overview of activities pointed out in this category’s drawings can be found in *table 4*.

Jumping	Flowers/fruit forest	Slides	Earth (sand)	Swings	Water (swimming)	Water (other)
4	*6*	*9*	*10*	*8*	*8*	*7*
Skelters	Playground equipment	Relaxing	Climbing	Sports	Animals	Else
5	*11*	*4*	*4*	*4*	*2*	*4*

Table 4. Outcome drawings 9-12-year-olds (Expeditie)

The highest scoring activity for 9–12-year-old children, if combined, is “water”. They would like to have the ability to go swimming, whether this is in a pool or in a pond, and play games in the water with inflatables. They also seem to see the value of water as part of a natural area, as they picture fish swimming around, steppingstones to jump over and rafts to move around on the water. Other high-scoring activities are playground equipment, slides and swings. With playground equipment they mainly mean a flying fox, but also seesaws, circle bikes, and playhouses. The last highly ranked activity is earth and sand. Something different from the first group´s drawings, are the mud paths drawn by the 9-12-year-olds. They seem to be curious about what effects water has on soil and the obstacles it brings along (and ways to deal with and explore this).

Figure 3. Drawing land management of The Wild Lands

Even though playgrounds are portrayed by most children in the 9–12-year-old group, one drawing in particular that pictured this caught our attention (*figure 3*). This is because the playground is completely fenced-in and even has prison vibes with the high fences, barbed wire, and the watchtower. It shows us that (some) children are really disconnected to nature and seemingly want to be protected against it. We suggest this may be a consequence of this child’s knowledge on nature and playgrounds, with many parks and playgrounds being fenced-in (especially in city limits).

Another drawing that caught our attention is *figure 4*. This is because of the similarity of the child’s idea on landscape design and our own ideas. As can be seen, the child drew a clear division between land that is used by people (there is lower vegetation and the presence of a human made water pump) and land that is not used by people (this has higher vegetation and seems to be wilder). This drawing

represents a way of a flowering and wild landscape, as we would like The Wild Lands to become.

Children attending school in a less privileged neighbourhood (7- and 8-year-old)

The Islamic Elementary School Yunus Emre provided us with 19 drawings from children in 4th grade. At first sight, we see a lot of colours used and a lot of natural elements. An overview of all the activities and the amount of drawings they are found in is given in *table 5*.

Tree house	Flowers/fruit forest	Swings	Playground equipment	Playing together	Climbing (in trees)
4	*13*	*1*	*2*	*4*	*8*
Water	Jumping	Animals	Slides	Relaxing	Rainbow
2	*2*	*14*	*4*	*1*	*12*

Table 5. Outcome drawings 7-8-year-olds (Yunus Emre)

Standing out is that these children, especially compared to the same aged children in the other school, are really focussed on nature-based activities, such as the fruit forest, climbing in trees, and having animals around. The highest scoring activity, animals, takes many forms. These children seem to be interested in a wide range of species, from mammals (like dogs and cats) to insects (such as butterflies and bees), and even other animals like worms, snails, and turtles. The last thing that is really popular is rainbows. However, it is not totally clear whether these rainbows are just rainbows or represent a climbing rack of some sort. Human made equipment (to which belong swings, slides, and other playground equipment) are not that popular at all.

Logistics

Although our focus is mainly on connecting children with nature while conserving the landscape, some other issues need to be pointed out as well. These can be divided into four categories: maintenance, children's needs, money, and animals.

Maintenance

Who is working there?
It's important to have a person / a few people (wildlander or a house owner (who is frequently there) present there) in the area, to be able to maintain the land, to take care of the animals present and food forest. Also, this person (keeper) will need to make sure that the people coming and going don't ruin the land or over "make it", considering the value we have of rewilding. This person would also be responsible for showing everyone the area when they come and teach them the "rules" of the space.

Who is volunteering?
We would like to include locals of the area involved in our project (permaculture principle 5 & 8), we believe that they would be interested in the farming and animal keeping, they could have benefits, as keeping some of the fruits or honey for themselves and at the same time we could try and focus more on bringing the younger locals there in order to learn. At the same time, they could help around and gain more insights into the importance of rewilding and nature conservation.

What benefits do they gain? (food forest, studying rewilding)

- Students:
  Wageningen University of Research is a university full of students studying subjects like forest conservation, plants biotechnology and so on, the possibility for students to come there to study in practice for some of their subjects would be great for both students, but also the organization, because they will benefit from learning and in exchange, they can help maintain the area and make sure that the process of rewilding will be smooth.

  Idea: Perhaps students can do their mandatory internship for their study programme for The Wild Lands and thus there is always a person to help our Wildlander.
  The area might be inaccessible (transport wise) for some of the students, we thought that in order to make it easier for them to get there, a weekly minibus could be a solution.

- Guests:
  For this project to work, we want to believe in our guests, the ones renting the houses, but also the ones coming to visit to have fun, enjoy nature or study. Everyone will need to participate and bring their knowledge or abilities to help the area.

Children's needs

One of the first questions we asked ourselves is the next: *What mode(s) of transport can children (and their supervisors) use to visit The Wild Lands?* Most common options for private transportation in the Netherlands are by foot, by bike or by car. For public transportation a bus or train is used. We recognize that children will not be able to go somewhere by themselves, since they need supervision. Therefore, we acknowledge that they are dependent on the modes of transport their parents or caretakers own. Less privileged families, which The Wild Lands want to include, usually don't have a car and need to move around in another way. The distance crossed by foot or bike is limited and public transport may be too expensive or too far away from its destination. If families want to visit The Wild Lands on their own, it is necessary to have it placed in a good infrastructural network with options to arrive by multiple modes of transport. Another option to get children to the Wild Lands would be by organizing a school trip with bus transport arranged by the school.

Another question concerning children's needs is the following: *How can we include handicaped children?* We see The Wild Lands as a place that wants to include everyone. Even though less privileged children are emphasized by the commissioner, children with a handicap should not be excluded. Facilities that should be present are, among other things:

- special sanitation for both people who can stand up difficulty (usually for but not excluded to elderly, for them a high toilet with brackets is needed) and people in a wheelchair (they need an extra spacious bathroom with a lower toilet, since their toilet chair needs to be placed over the toilet seat)

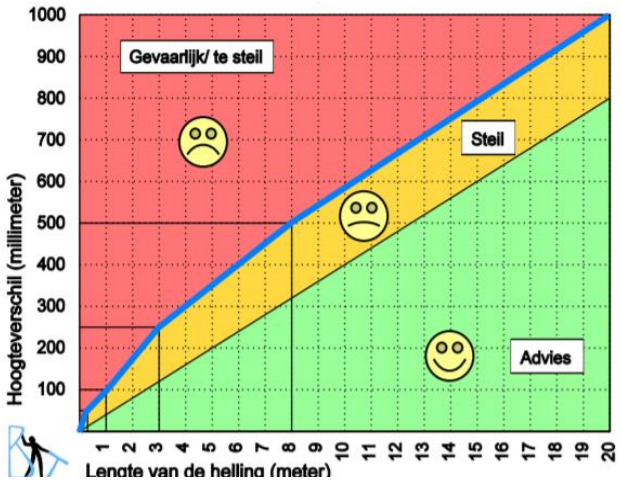


Figure 5. Advised ramp steepness (Kenniscentrum Groen & Handicap, 2017)

- good paths without bumps, made of hard materials such as wood or stone (for wheelchair users and people with walking difficulties)
- shortcut roads made out of other materials than the main roads that provide another view on experiencing nature (for people with hearing and seeing difficulties and more adventurous wheelchair users)
- a wheelchair ramp to access buildings (legally the slope's angle cannot come over 5%, but best would be to use a maximum of 4%, see *figure 5*)

Besides the presence of several facilities, enough information should be available on several aspects as well. It is important to include the following information both textual and visual (in a map and using symbols and signs):

- the degree of accessibility: type of roads, the width of possible gates, the type of landscape (think about hills and their slope), the placement of ramps (and their slope)
- sanitation placement: where several kinds of sanitation can be found on the property
- dangerous locations: such as crossroads (this way caretakers can prepare for these encounters)

Money

Something very important to realize is that a project this size needs serious funding. Not only in order to start this project, but also to cover for the maintenance costs. *How can we generate an income?* As our commissioner suggested, Wildlanders can indeed rent out their houses using Airbnb for some time of the year. Another way of creating an income is by selling products produced on the land. These products can for example be honey from beehives or milk and cheese from goats or sheep. Another possibility is opening the food forest for other people than the children going on a school trip. Here those people can pick their fruits and vegetables themselves and pay per kilo. This does not only provide them with fresh food, but also gives them the memory of participating in a fun activity, which results in mouth-to-mouth advertisement and the will to come back another time. Little is known yet about possible costs (for example about the plot expenses and the building activities), so more research on costs and income and a complete business plan is still needed.

Animals

Lastly, we were thinking about including animals in the project of The Wild Lands. Taking care of animals takes a greater responsibility and should therefore be considered thoughtfully. The most important questions here are: *who will take care of the animals?* and *who will pay for their care?* To answer the first question, we are in need of someone with a great feeling of responsibility, knowledge, and time. Depending on the kind of animal, care is needed in- and outside of business hours, so we would need someone who is more or less always present. Hence, this must be a Wildlander. This Wildlander can be compensated for his time by reducing his house price for example. There may be an option to sell animal products, such as milk, cheese, and fur. From the income created by these expenses can be covered (and what is left can be used for financing other expenses within the project or for compensating the Wildlander). However, as stated before, more research on a business plan is needed.

Besides the more logistic parts of animal caretaking, we also wondered: *what kind(s) of animals should be introduced?* Looking at animals that are not in need of much care, we think of rabbits or guinea pigs. However, these animals are not of much use for the values of The Wild Lands, other than being petted by children. Of greater use would be animals that can maintain the area and may produce some kind of income as well. With the goal of creating a moor landscape, best would be to use some kind of light weighted animals. Usually, sheep are used to prevent forest forming (“Handboek Schapenhouderij: Natuurtechnisch begrazingsbeheer,” 2002; van Dijck, 2013), but using goats is not unheard of either (Pater, 2021).

Recommendations

School trip

For school trips we suggested two options that can be organized according to the age group or the season: One-day trips are mainly made for younger kids or for the winter season, while two-day trips can be organized for older kids and for the summer season. In general, we tried to make the schedule as fluid as possible, and to provide the kids some time to discover the area by themselves and to do their own activities. Furthermore, we tried to offer enough sleeping time for the kids staying overnight since most trip organizers neglect that it is important for kids to have enough sleeping time. It is worth noting that the organizers can amend and adjust the activities based on their priority of values for the kids or limitations such as lack of workers, equipment, or land limits.

5-8 year old

1 Day Trip	
9:30	Arrival and greeting at the Wild Land- take shoes off at the arrival and make them connect with the soil from the start
9:45	Kids picking animal nicknames for themselves and divided into groups based on their nicknames
10:00	Breakfast- snack
10:30	Meet the animals and feed them Alternative: Vegetable garden
11:30	Hide and seek Alternative: Treasure hunt
12:30	Playground/free time
14:00	Lunch- mainly plant based
14:30	Plant & adopt a tree
16:00	swing, climbing, playing with the soil and nature
17:30	Collecting rocks and making shapes
18:00	Dinner
18:45	Arts show (let them draw and paint nature in a competition)- something that portraits nature or something they learned- maybe warms or new animals or new plants
20:00	Heading back home

Table 6. Possible activities 1-day school trip (5-8-year-olds)

9-12 year old

2 Day Trip	
Day 1	
9:30	Arrival and greeting at DWL
9:45	Kids picking animal nicknames for themselves and divided into groups (maybe based on their nicknames)
10:00	Breakfast/snack
10:30	A walking tour around the land while sharing some interesting facts about nature and deciding where to put the tents and also placing them
11:30	Making huts/tents Alternative: Arranging the sleeping area
12:30	Free time
13:30	Lunch while they help cook vegetarian food
14:00	Meet our foresters! (Getting the kids involved in activities such as naming the plants, growing them and learning to take care of them)
15:30	Treasure hunt
17:00	Trivia competition (questions about what they learned in that day- so they can understand better what they saw today) Alternative: Board/card games
18:30	Bonfire and dinner- dancing, marshmallow
21:00	start getting ready for sleeping time

Table 7. Possible activities 2-day school trip, day 1 (9-12-year-olds)

Day 2	
7:00-8:00	Wake up and Breakfast
9:00	Sports activities- free time
10:00	Tree climbing and getting down with a flying fox (place a big one from one big tree to another) Alternative: Card/board games
11:00	Collect stones and paint them with a nice shape/stone balancing
12:00	Arts show (let them draw and paint nature in a competition)- something that portraits nature or something they learned- maybe warms or new animals or new plants
13:00	Lunch
14:00	Let's pack our stuff and organize the place- clean after them on their own- learn nature responsibility
15:00	give them a personal present that represents the location (goodie bag) and back home!

Table 8. Possible activities 2-day school trip, day 2 (9-12-year-olds)

Arranging the landscape

When it comes to arranging the landscape, many different factors need to be taken into account. The permaculture principles can be useful in arranging the landscape. In order for nature to thrive and it still be used as a recreational area it is important to give nature enough room. In order to give nature (flora & fauna) room, it will be important to strive to have 10-20% of the landscape untouched. This will give nature the room to thrive. Below is an image showing how the landscape could (roughly) be arranged. The landscape could be divided into zones, working its way up from areas that are used most intensely to areas which are used least intensely. Using the permaculture principles to arrange the landscape can be done

according to zones. As the closer an element is to the centre of human activity, the more attention it will be able to receive in comparison with elements that are further away. As distance increases the amount of energy and time embedded in travel also increases, and as energy and time are limited it is important to arrange the landscape in such a way that energy and time are spared (Finch, 2015, *figure 6*).

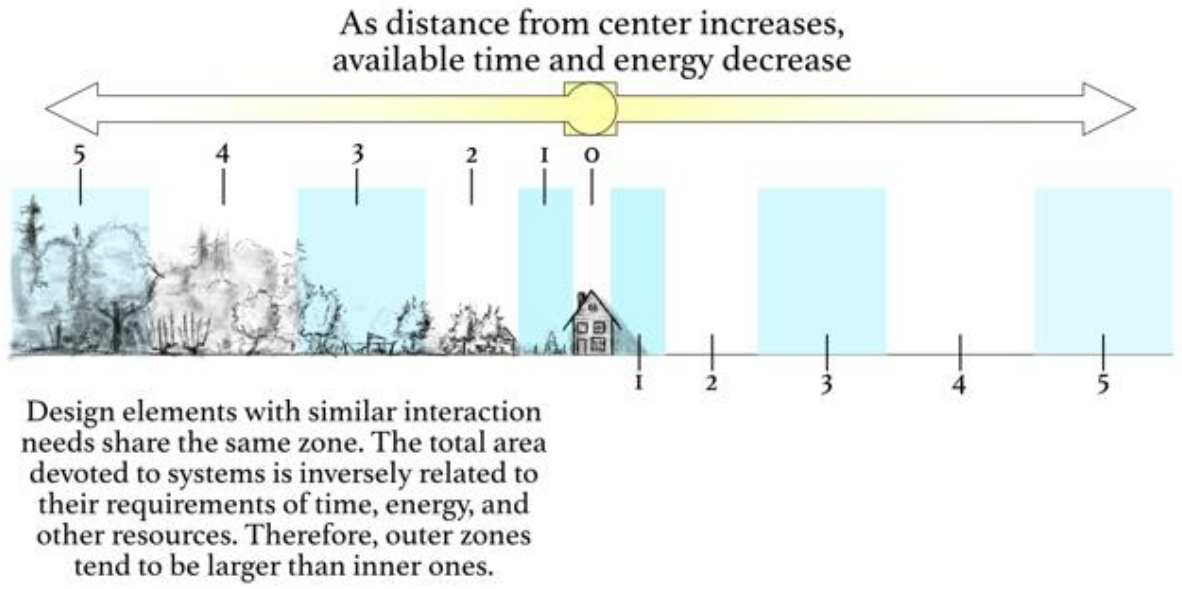


Figure 6. Zoning plan (Finch, 2015)

"Zone 0: Centre of activities - the house. This is high maintenance, high use and requires considerable investment of time and energy.
Zone 1: Annual plants, herbs, compost, plant propagation, construction and maintenance, bike store and other high use activities, greenhouse. Often irrigated
Zone 2: Dense planting, poultry and small livestock, orchard, polytunnels.
Zone 3: Large water storage, main crops, sheep, cows, field shelters.
Zone 4: Forestry, wood-pasture, dams, forage.
Zone 5: Wild zone, where nature is in charge and where we go to learn and harvest only that which is abundant." (Permaculture Association, z.d.)

Approximately six to ten houses will be placed in the living zone. The living zone will be the area which is used most intensely. The 'intense recreation area and food garden' zone will be used for the activities for the children's trips, here the tents can be places for children's trips. This zone will also be used for food gardens which need to be visited more frequently than the food forest. The 'food forest and nature recreation' zone will also be dedicated to the children's trips, but also for everyday people to walk through and enjoy nature. The last 'untouched area' is the last zone, this is the area which is meant strictly for nature. This creates a safe space for birds and other animals. This 'untouched' area should be as close to another nature area as possible, in order for a more natural flow of flora and fauna between the landscape and surrounding natural area.

Figure 7. Zoning plan for The Wild Lands

Conclusion and discussion

Conclusion

In this research we focused on rewilding and connecting children with the Wild Lands. We looked at why it is important to connect children who have less access to green spaces with nature and how we could improve this connectedness. Regarding the rewilding process we argue that permaculture and zoning are good methods that could be employed. Furthermore, we concluded that school trips would be most feasible and useful to connect children with nature. In order to understand what children would want from a school trip we asked them to draw their ideal nature trip and what they would like to do in nature. These drawings helped us create a plan for the school trips. With our project we hope to inspire to start *Tiny People Tiny Footprint*.

Discussion

One of the biggest limitations of our research was interpreting and analysing the children's drawing. Since we did not directly interact with the children or ask them about their drawing, we can only hope that we can interpret their drawings correctly. Secondly, as we gave the teachers the task to ask the children to draw their ideal nature recreation area and we were not there ourselves we do not know how each teacher explained the task. How the task is explained can influence what the children draw. If for instance the teacher would give the children an example of what they could draw, the children could be inclined to draw that exact example. This could negatively influence the results. Since we were not there, we cannot know what the task was explained and executed.

It is important to keep in mind that when implementing these recommendations, trial and error is part of the process while staying open for change (permaculture principles 1, 9 & 12).

If research on this specific project were to be continued, it could be useful to look into the transportation problem, this could be done from a spatial planning approach/study. Another area to look into (by e.g., business studies student) is the funding/ business plan side of the project. From a broader perspective, further research could investigate the phenomena where low-income children are less likely to have connection with nature due to underexposure to it, compared with higher-income children, specifically in the case of the Netherlands.

Literature

Barrable, A., Booth, D. (2020). Increasing nature connection in children: a mini review of interventions. *Front. Psychol.,11*, 1-7. https://doi.org/10.3389/fpsyg.2020.00492

Borunda, A. (2020). How 'nature deprived' neighbourhoods impact the health of people of colour. *National Geographic*. Retrieved from https://www.nationalgeographic.com/science/article/how-nature-deprived-neighborhoods-impact-health-people-of-color

Bureau Peter de Ruyter. (2021, 11 mei). Rabatbossen en toekbossen in de IJsselvallei. Peter de Ruyter Landschapsarchitectuur. https://peterderuyterlandschap.nl/rabatbossen-en-toekbossen-in-de-ijsselvallei/

Finch, J. (2015, 10 December). *Permaculture Zones of Use: A Primer*. The Permaculture Research Institute. Geraadpleegd op 14 oktober 2021, van https://www.permaculturenews.org/2015/12/11/permaculture-zones-of-use-a-primer/

Geczi, E. (2019, march). Nature field trips: making learning come alive for young children. *The Natural Start Alliance.* Retrieved from https://naturalstart.org/feature-stories/nature-field-trips-making-learning-come-alive-young-children

Handboek Schapenhouderij: Natuurtechnisch begrazingsbeheer. (2002). Retrieved October 4, 2021, from https://edepot.wur.nl/15629

Hernandez et al. (2020). Connectedness to nature: Its impact on sustainable behaviours and happiness in children. *Front. Psychol.* https://doi.org/10.3389/fpsyg.2020.00276

Kenniscentrum Groen & Handicap. (2017, maart). *'Samen op Pad' zelfstandig & drempelvrij genieten van de natuur.* Stichting Groen & Handicap. Retrieved from https://www.natuurzonderdrempels.nl/images/documenten/samen_op_pad_totaal.pdf

Lumber. R., Richardson, M. Sheffield, David. (2017). Beyond knowing nature: contact, emotion, compassion, meaning, and beauty are pathways to nature connection. PLoS ONE 12 (5), 1-24. https://doi.org/10.1371/journal.pone.0177186

Mollison, B. (1991). *Introduction to Permaculture*. Permaculture Resources.

Otto, S., and Pensini, P. (2017). Nature-based environmental education of children: environmental knowledge and connectedness to nature, together, are related to ecological behaviour. *Glob. Environ. Change* 47, 88–94. https://doi.org/10.1016/j.gloenvcha.2017.09.009

Pater, M. (2021, September 24). Robuuste landgeit graast over Ermelose heide: ‘Een geit knabbelt overal aan.’ Retrieved October 4, 2021, from https://www.destentor.nl/veluwe/robuuste-landgeit-graast-over-ermelose-heide-een-geit-knabbelt-overal-aan~a809e799/?referrer=https://www.google.com/

Permaculture Association. (z.d.). *Designing - Zoning*. Retrieved October 14, 2021, from https://www.permaculture.org.uk/design-methods/zoning

Rowland-Shea, J., Doshi, S., Edberg, S., Fanger, R. (2020). The nature gap, confronting racial and economic disparities in the destruction and protection of nature in America. *Center for American Progress,* 1-26. https://cdn.americanprogress.org/content/uploads/2020/07/22122827/The-Nature-Gap4.pdf?_ga=2.207476819.115430611.1633947439-405483491.1633947439

Stephens, K. (2007). *Curiosity and Wonder: Cue Into Children’s Inborn Motivation to Learn.* Parenting Exchange. Retrieved October 10, 2021, from https://www.easternflorida.edu/community-resources/child-development-centers/parent-resource-library/documents/curiosity-and-wonder.pdf

Strife, S and Downey, L. (2009). Childhood development and access to nature, a new direction for environmental inequality research. *Organ Environ* 22 (1), 99-122. 10.1177/1086026609333340

Sullivan, P. (2001). Holistic Management A Whole-Farm Decision Making Framework. Retrieved October 7, 2021, from https://www.canr.msu.edu/foodsystems/uploads/files/holistic.pdf

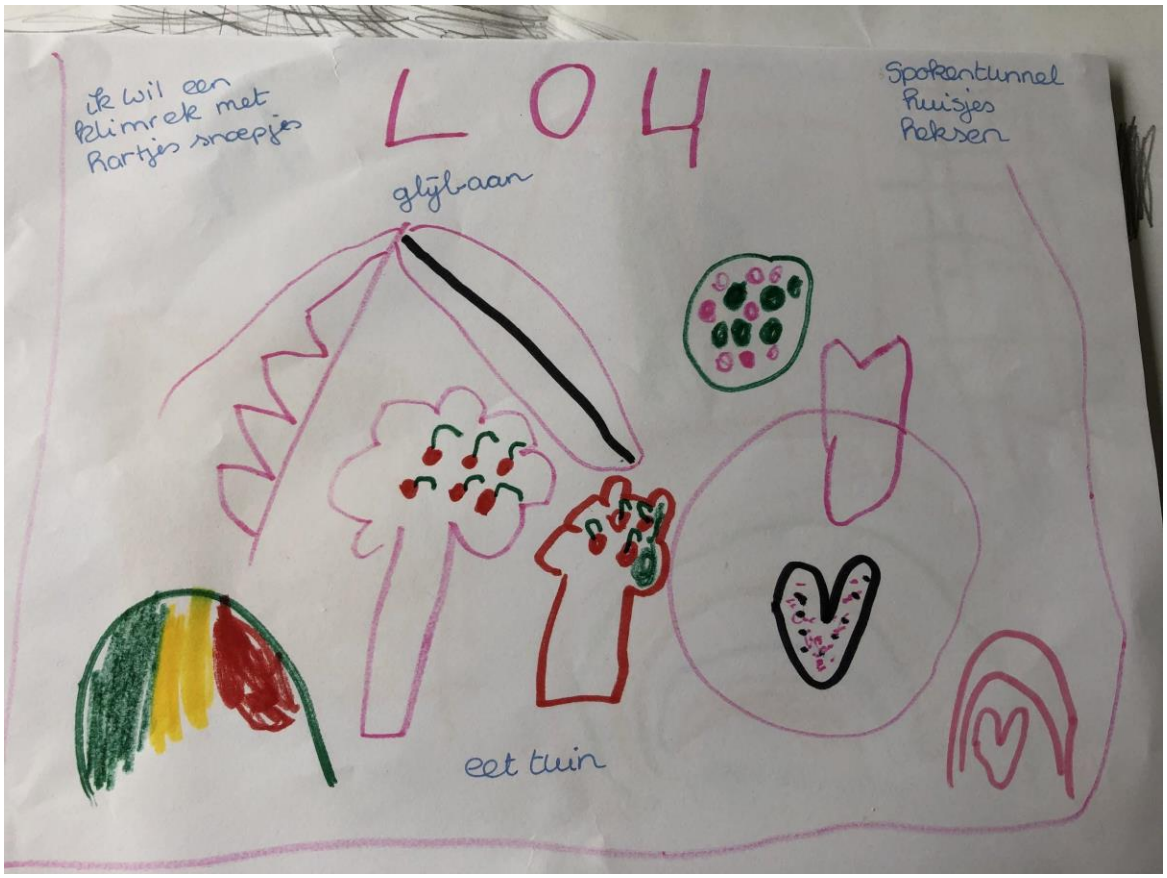
Tierolf, B., Steketee, M., Gilsing, R., Bellaart, H. (2017). Leefomstandigheden van kinderen met een migratieachtergrond. *Kennisplatform Integratie en Samenleving.* Retrieved September 24, 2021 from https://www.kis.nl/sites/default/files/bestanden/Publicaties/leefomstandigheden-kinderen-met-een-migratieachtergrond.pdf

Van Dijck, L. (2013, September 6). Schapen inzetten voor natuurdoelen. Retrieved October 4, 2021, from https://edepot.wur.nl/274555

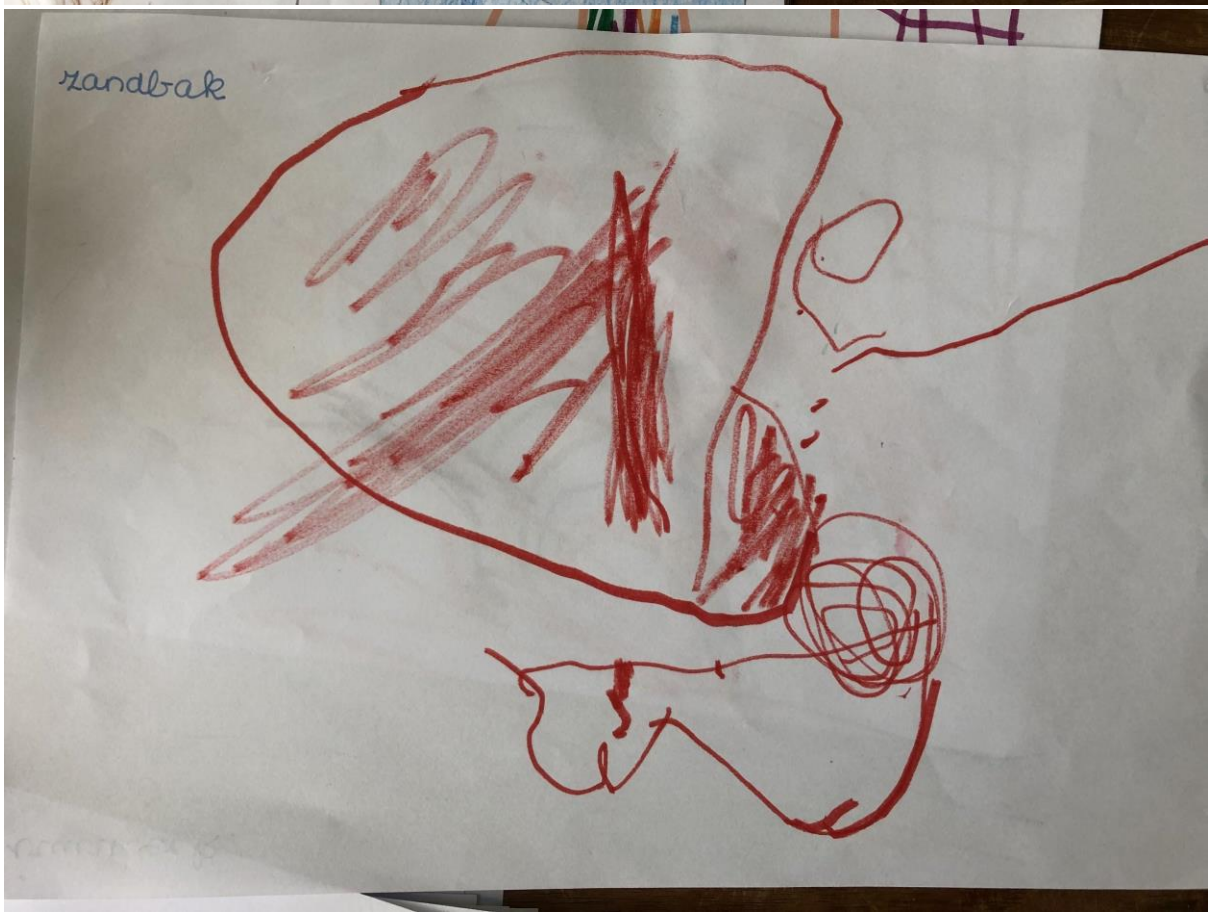
Van Neste, P. (2019). Children’s ideas for designing educational forest gardens in the Netherlands. Wageningen University and Research, Wageningen. Retrieved September 30, 2021, from https://edepot.wur.nl/543680

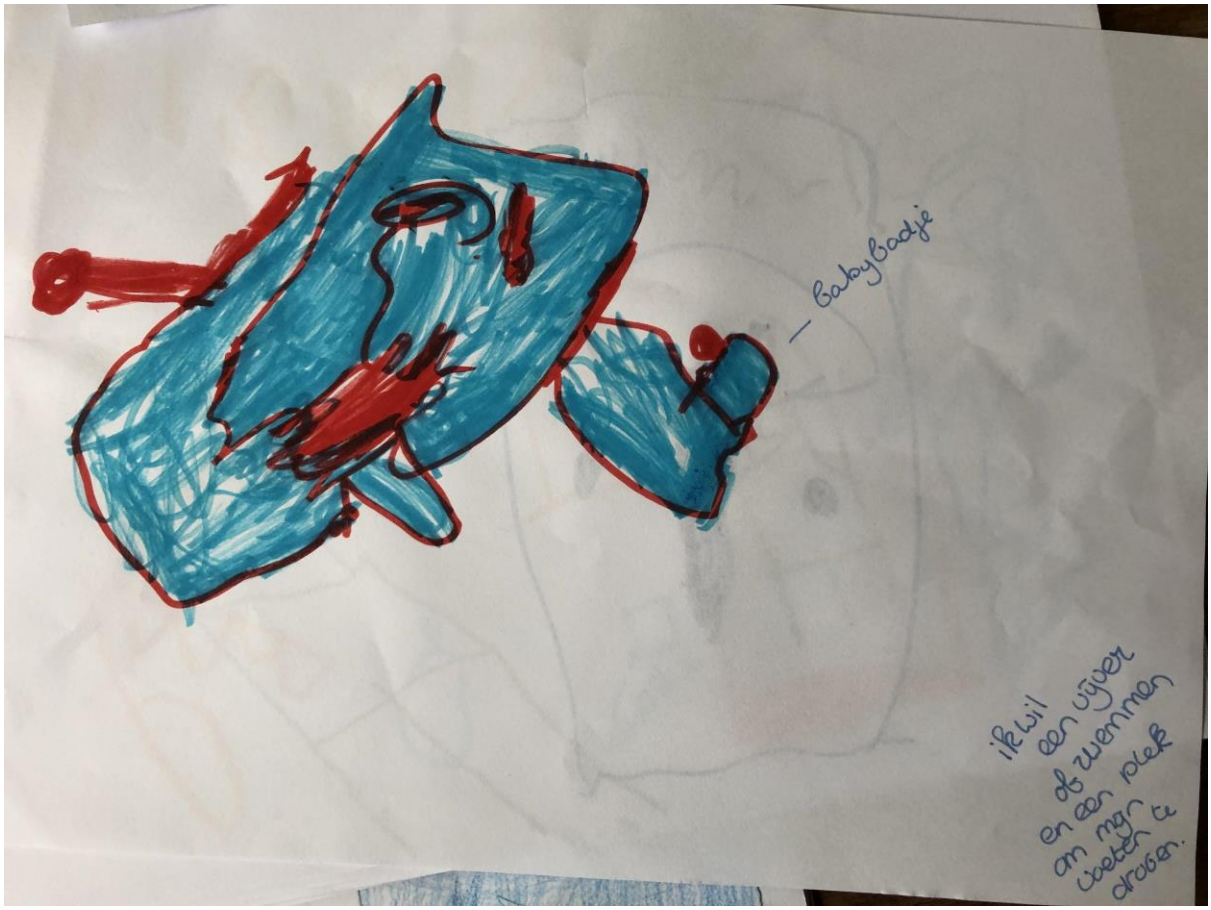
Waddington, E. (2021, 26 January). *The 12 Principles of Permaculture: A Way Forward*. Ethical.Net. Retrieved October 13, 2021, from https://ethical.net/ethical/permaculture-principles/

Annex 1 - Drawings 5-8 year



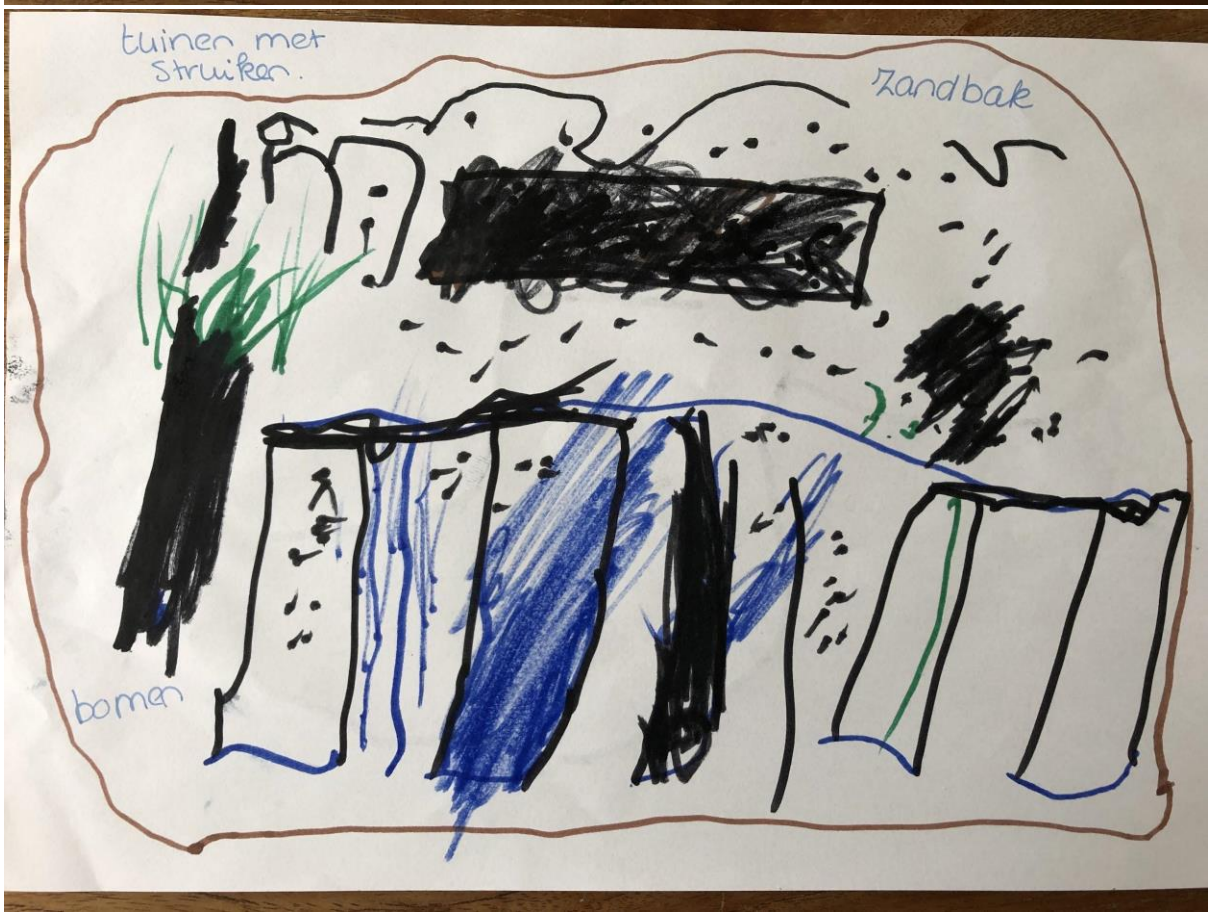

Lieke
klimrek en aan te hangen
zandbak
skippyballen

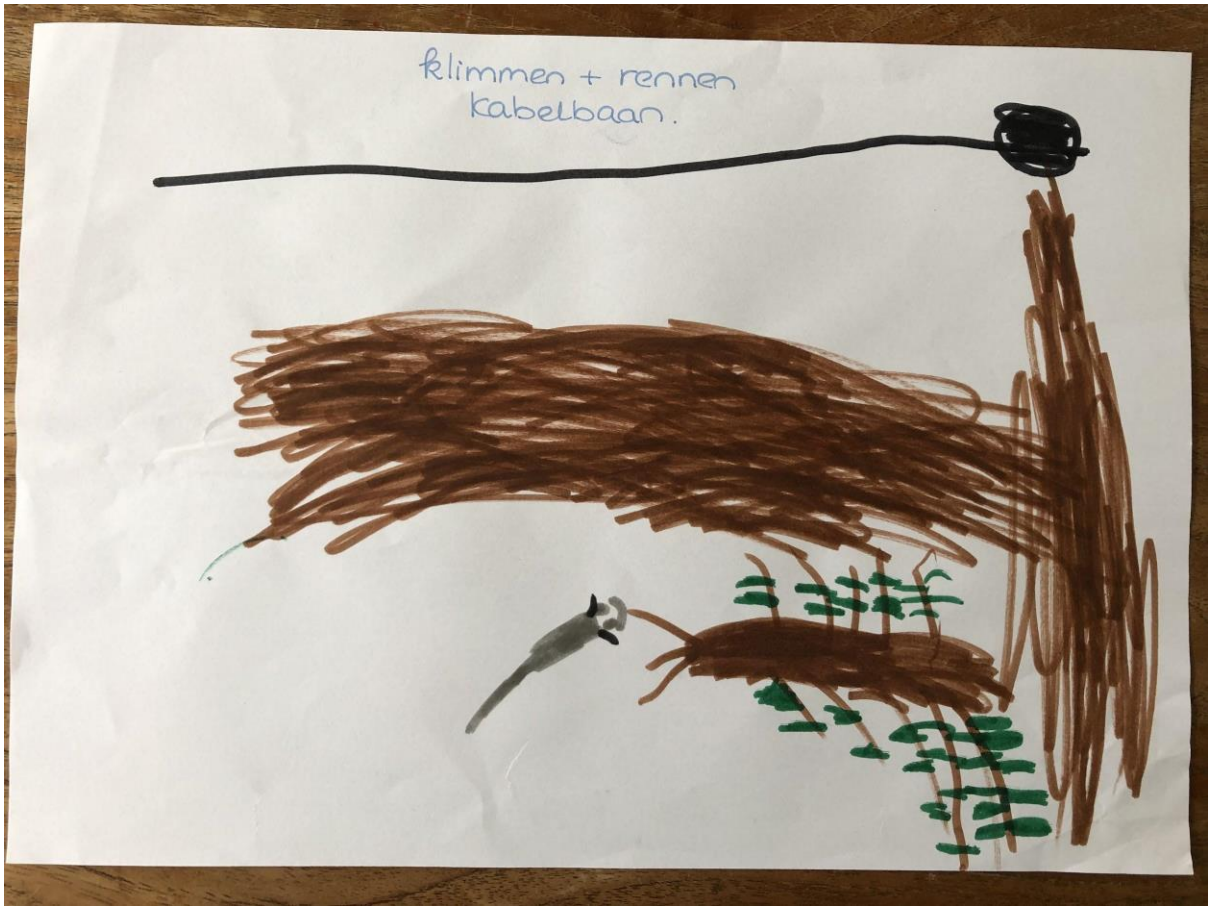

zandbak


BabyBadje
ik wil een vijver als zwemmen en een plek om mijn boeken te drogen.


Wisne
raket

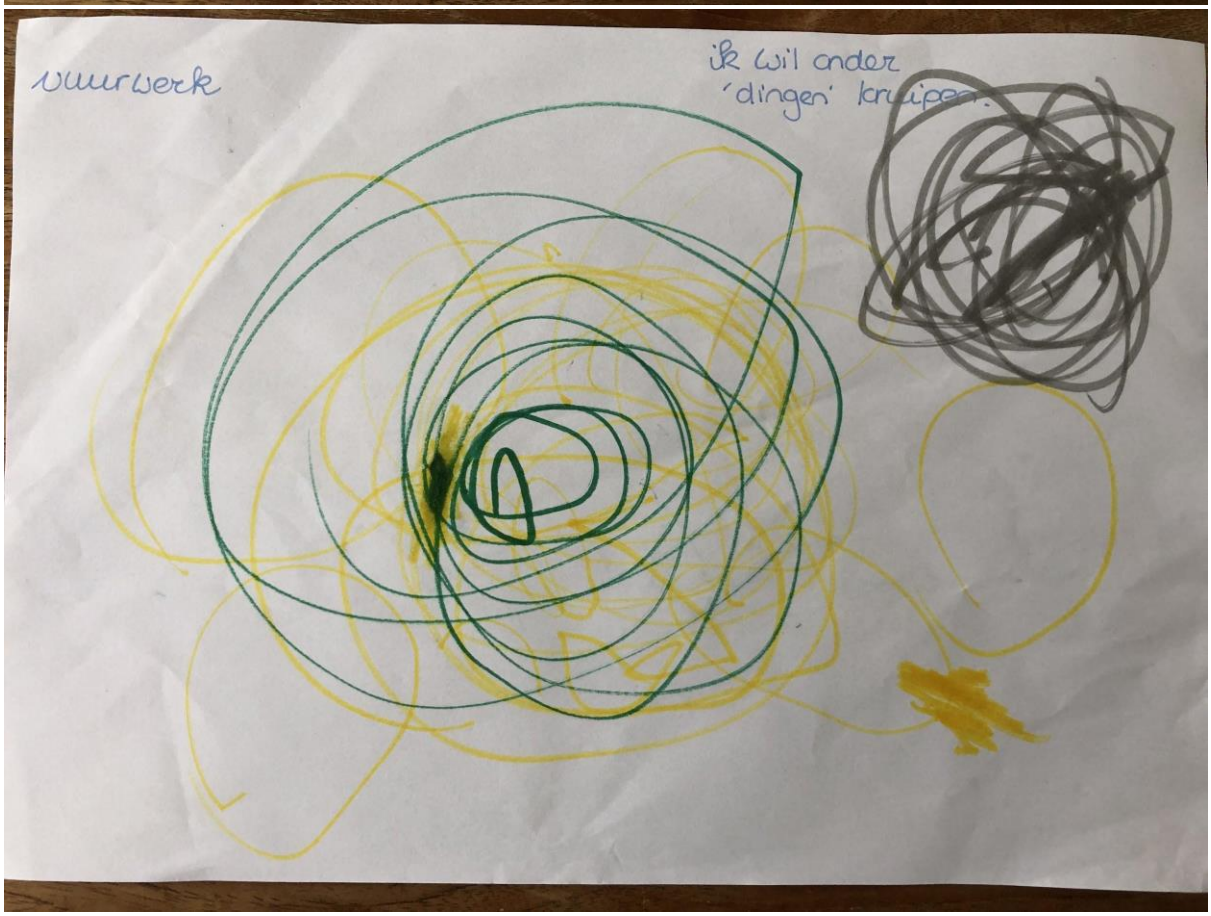

boomstam
tunnel
ik wil glijbanen en bomen.

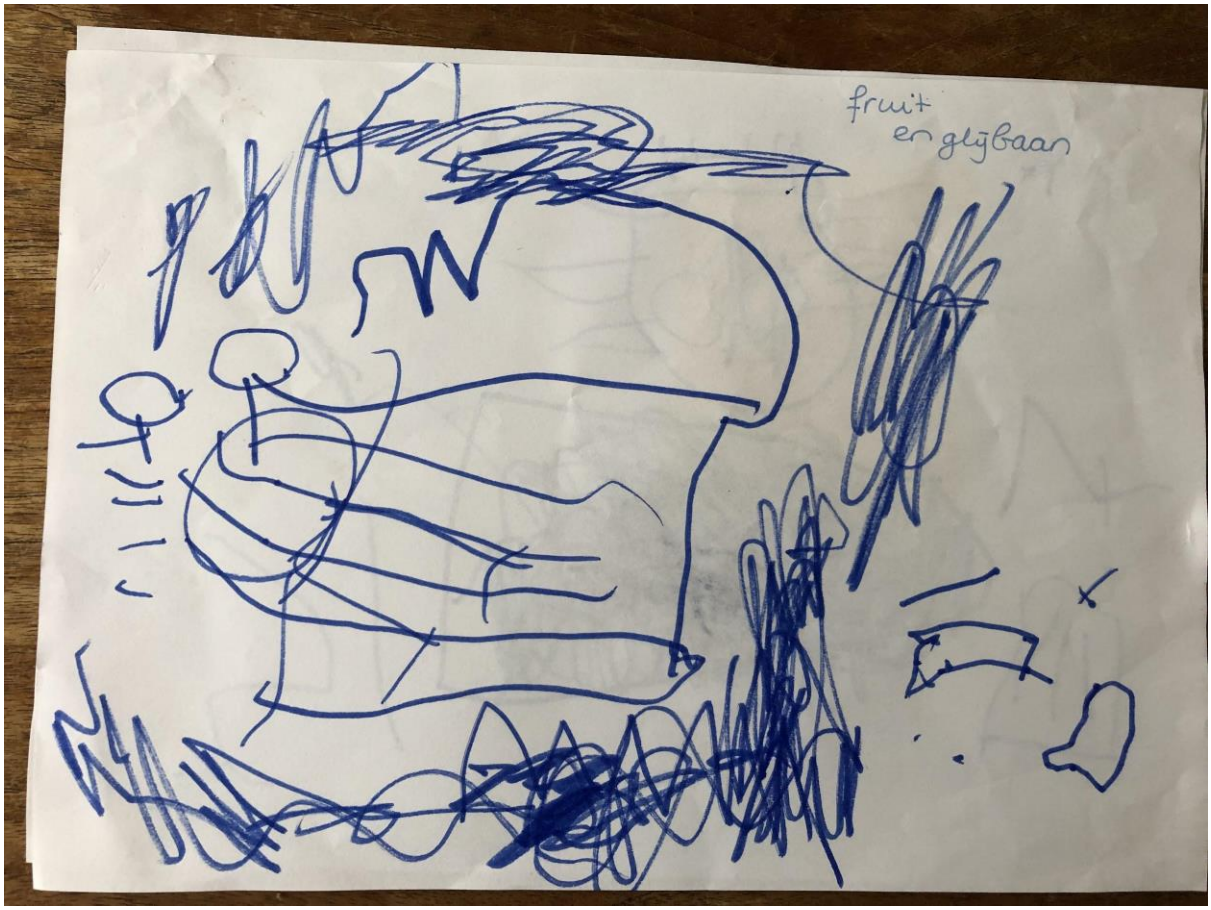

tuinen met struiken.
zandbak
bomen


klimmen + rennen
kabelbaan.


groot
zwembad
of vijver.

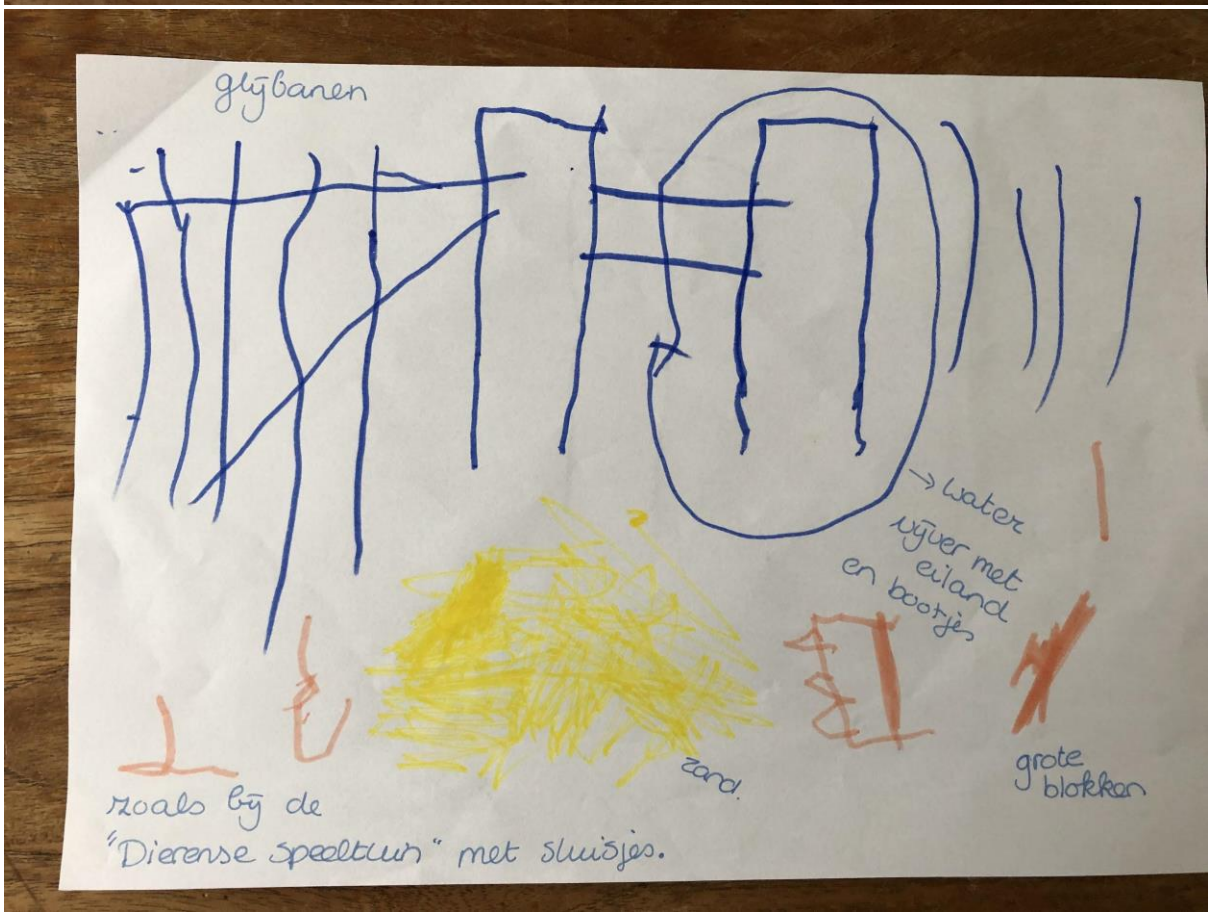

vuurwerk
en 2 glijbanen.


vuurwerk
ik wil onder
'dingen' kruipen.

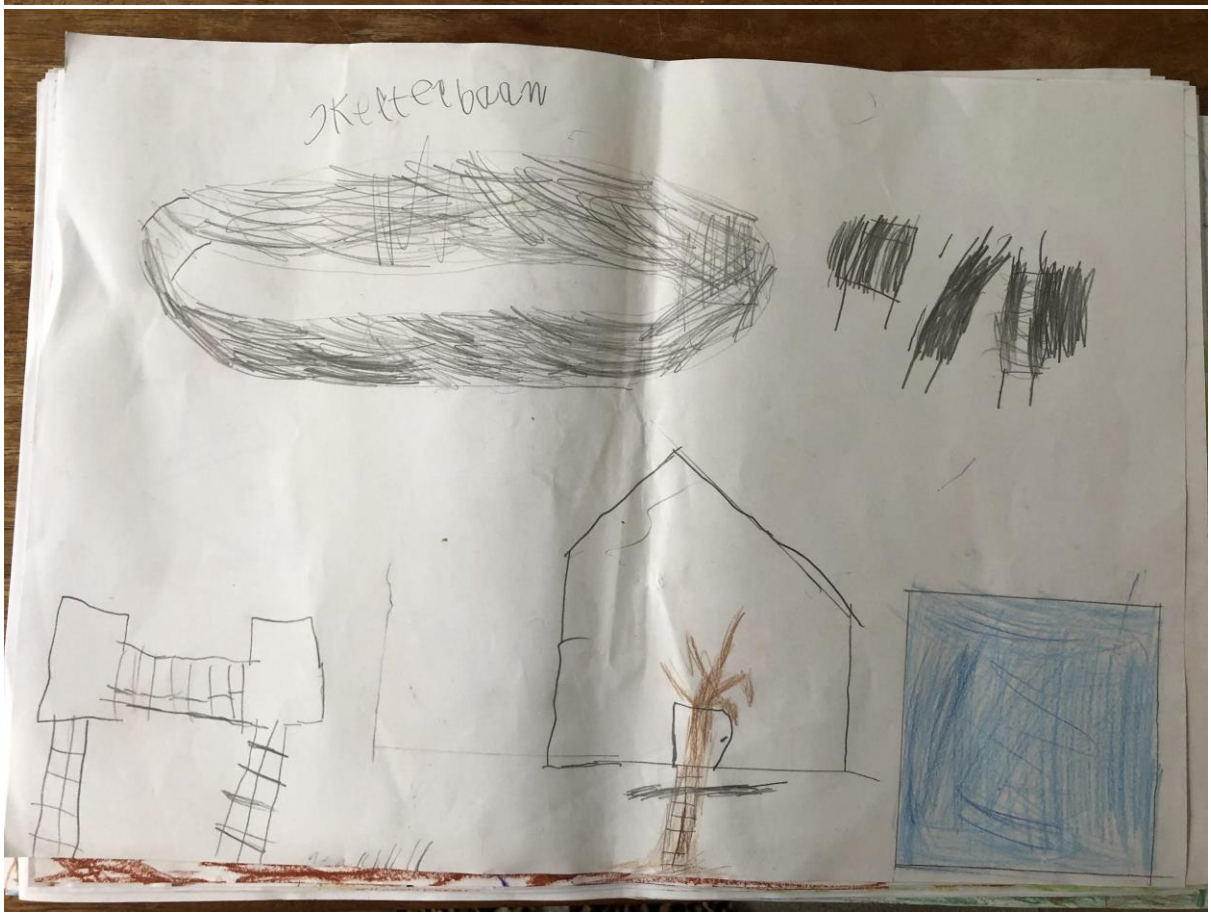

fruit
en glijbaan


zandbak
glijbanen zijn leuk.
met de waterpomp


auto's
of skelters


glijbanen
→ water
vijver met
eiland
en bootje
zand
grote
blokken
zoals bij de
"Dierense speeltuin" met sluisje.


ik wil klimmen
op boomstammen
en trapjes


Kletterbaan


hangmat
Zwemvijver
boomhut
Veel zand
grote trap

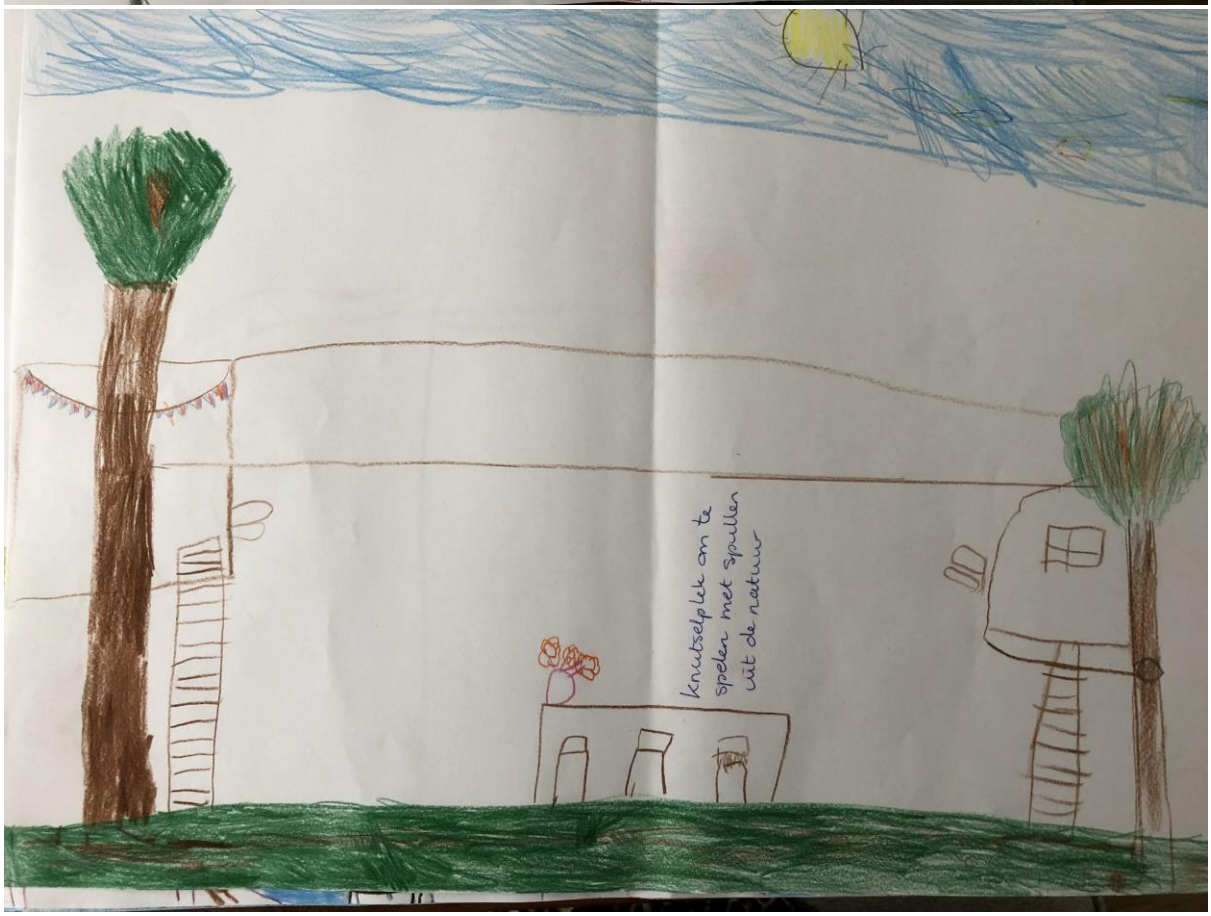

boomhut
glijbaan
tenten bouwen
Schommels

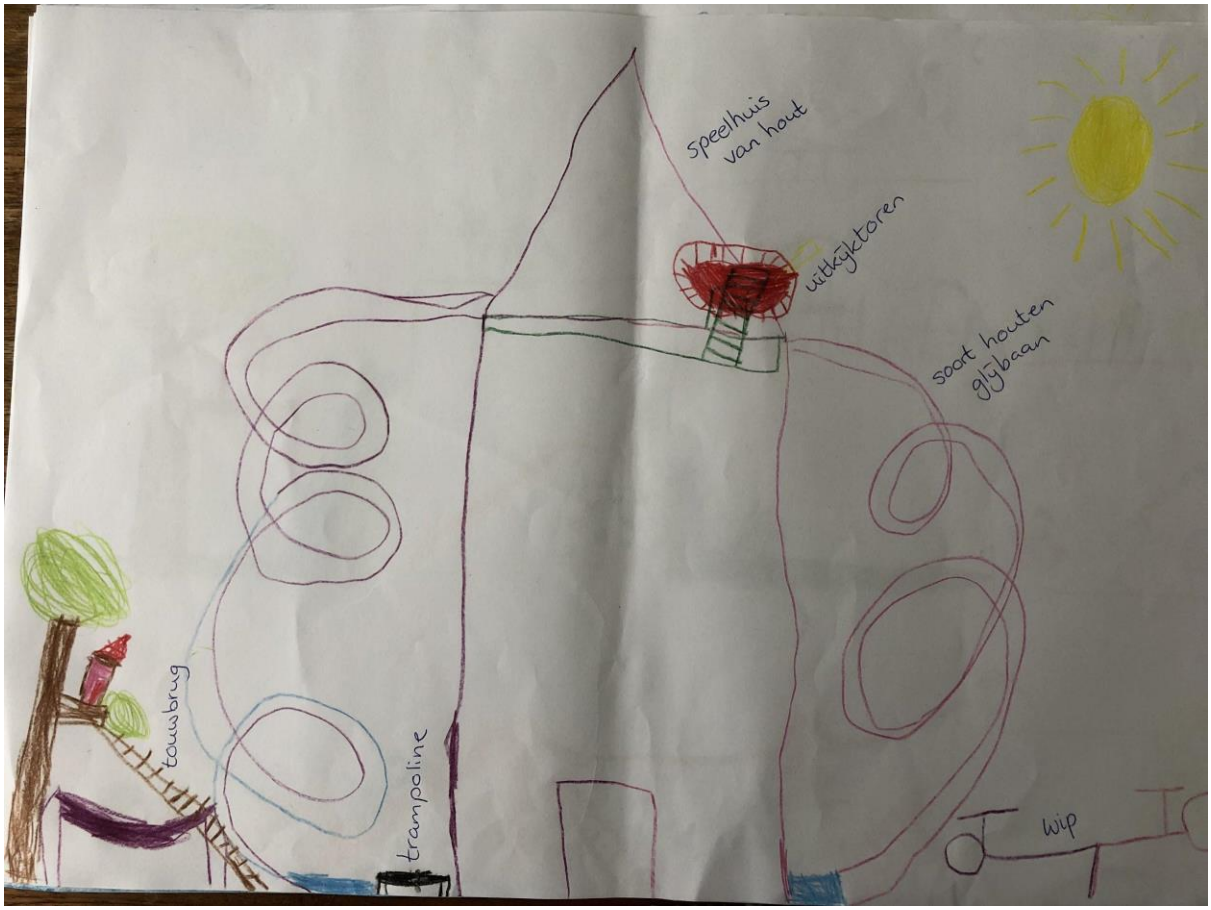

boomhut om zelf te maken


trapon een boom
skelters
springkussen

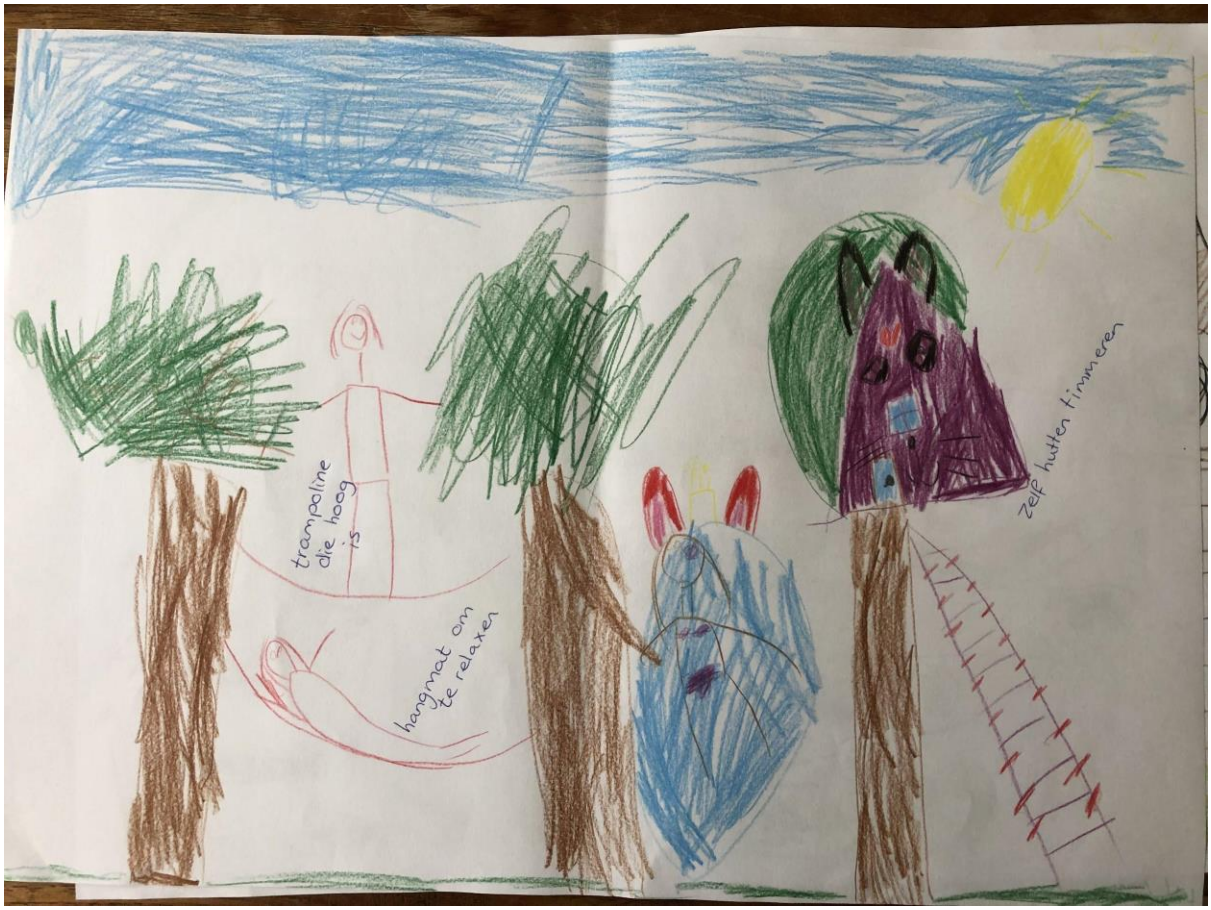

rubber touw
ondergrondse glijbaan


glijbanen, heel veel
klimladders

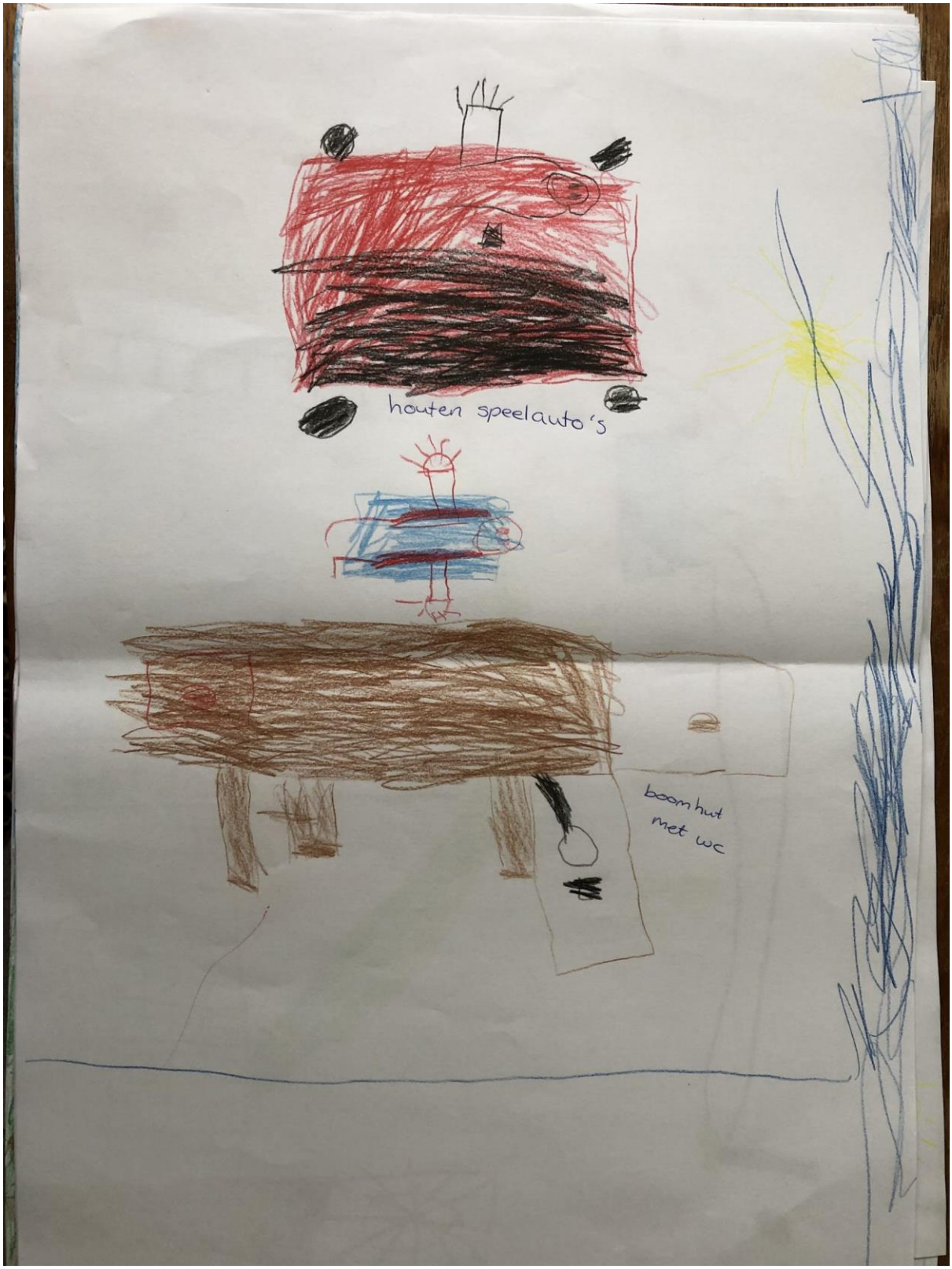

kruidselplek om te
spelen met spullen
uit de natuur


speelhuis van hout
uitkijktoren
soort houten glijbaan
touwbrug
trampoline
wip


dieren om te verzorgen
veel bloemen of een fruk-tuin
boogschieten

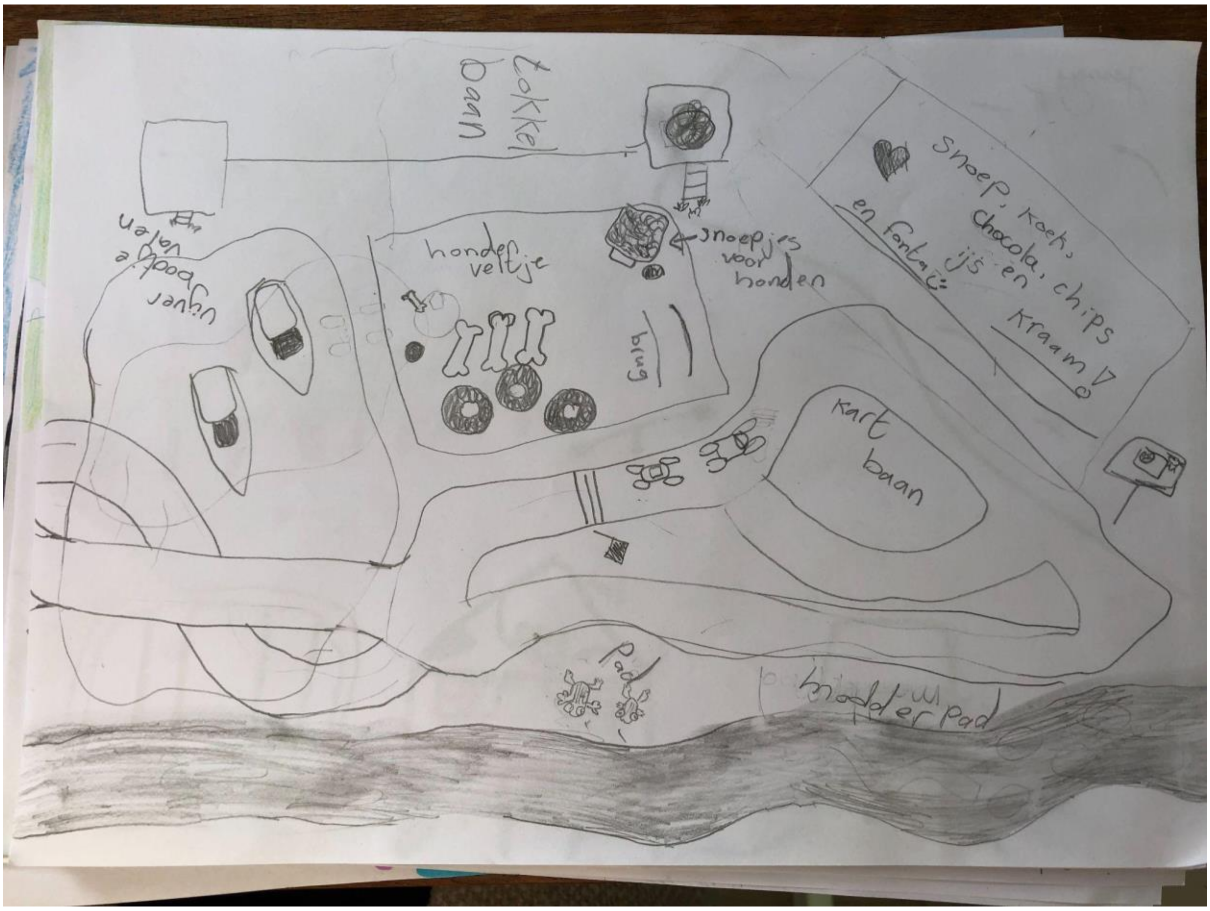

trampoline die hoog is
hangmat om te relaxen
zelf hutten timmeren


autobanden
stapstenen
gras
water met vissen

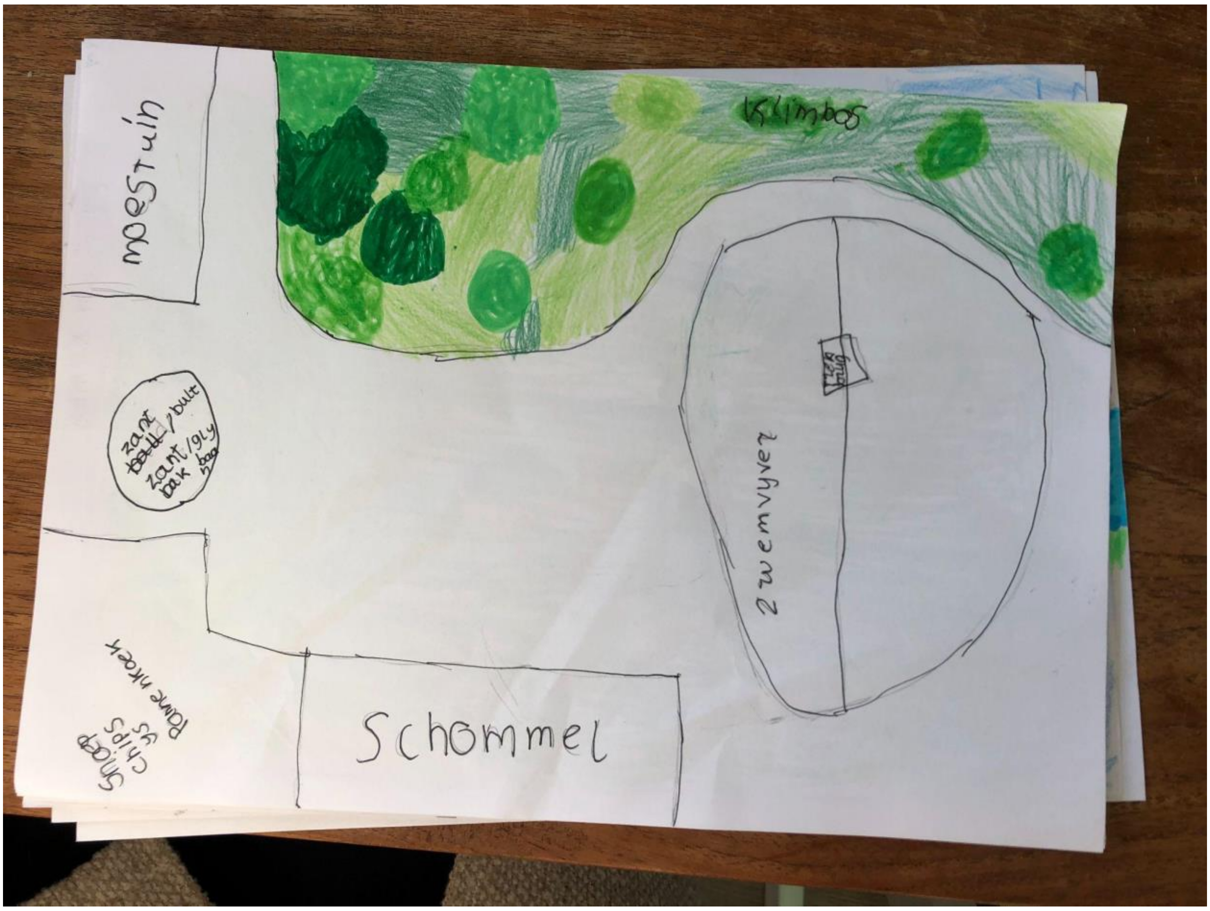

houten speelauto's
boom hut
met wc

Annex 2 - Drawings 9-12 year

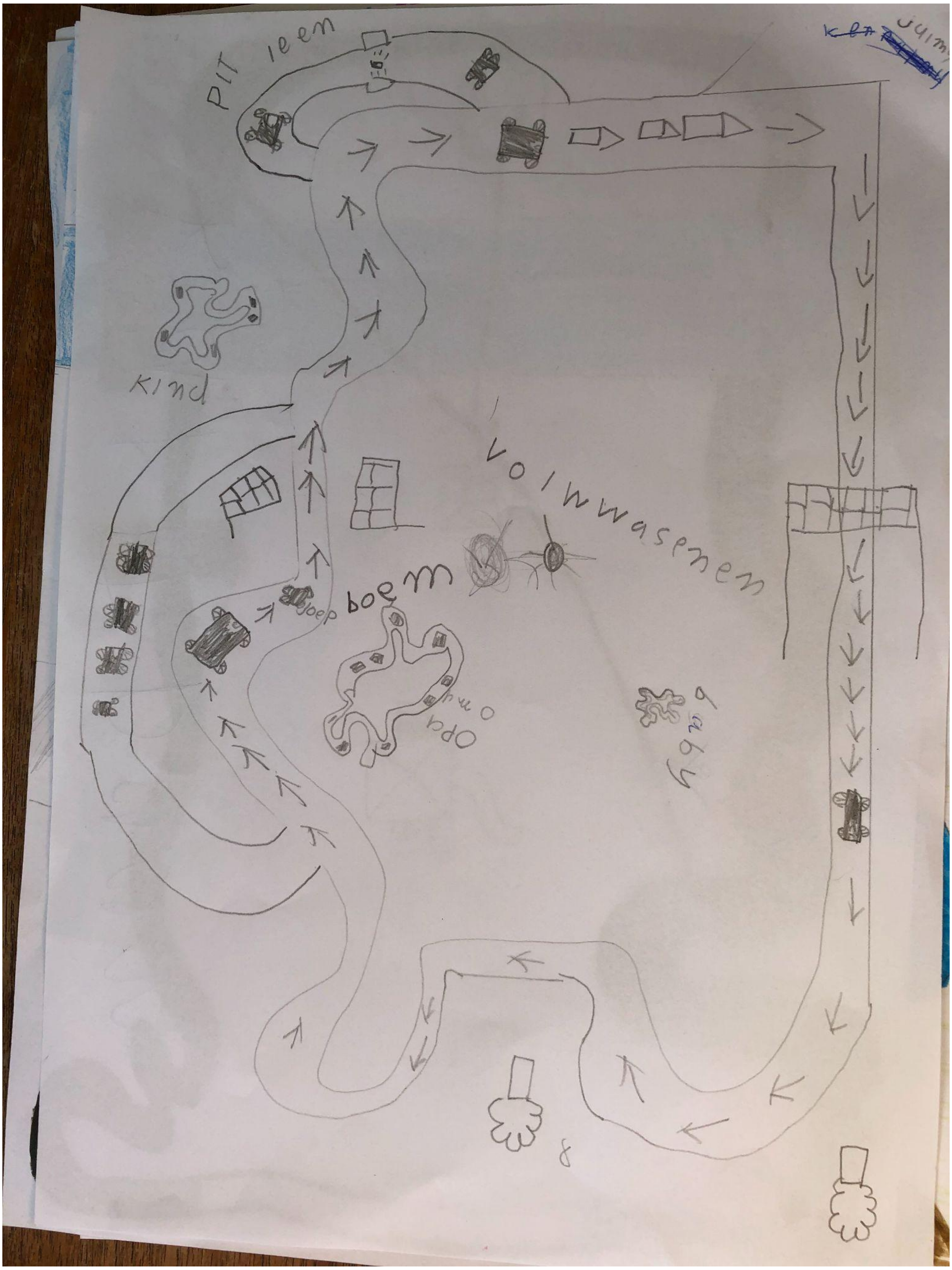

sla
Moestuin
Bos
speeltuin
Meer
Brug

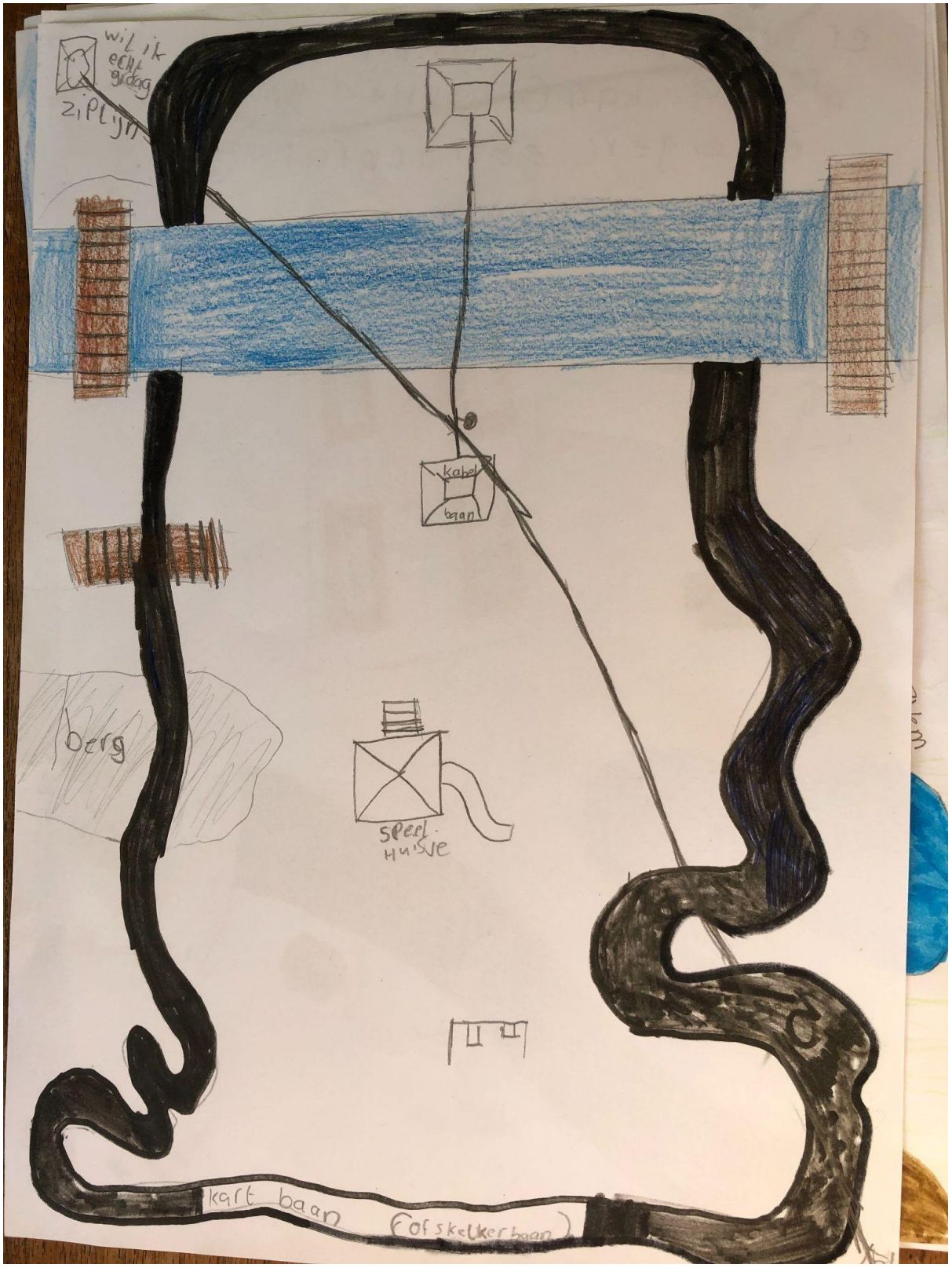

tokkel baan
honden veldje
snoepjes voor honden
Snoep, koek, chocola, chips ijs en fanta kraam!
brug
Vijver bootje varen
Kart baan
Pad
Modder pad


Boomen
vijven
Schommel
huisje
glijbaan


moestuin
klimbos
zwemvyver
Schommel

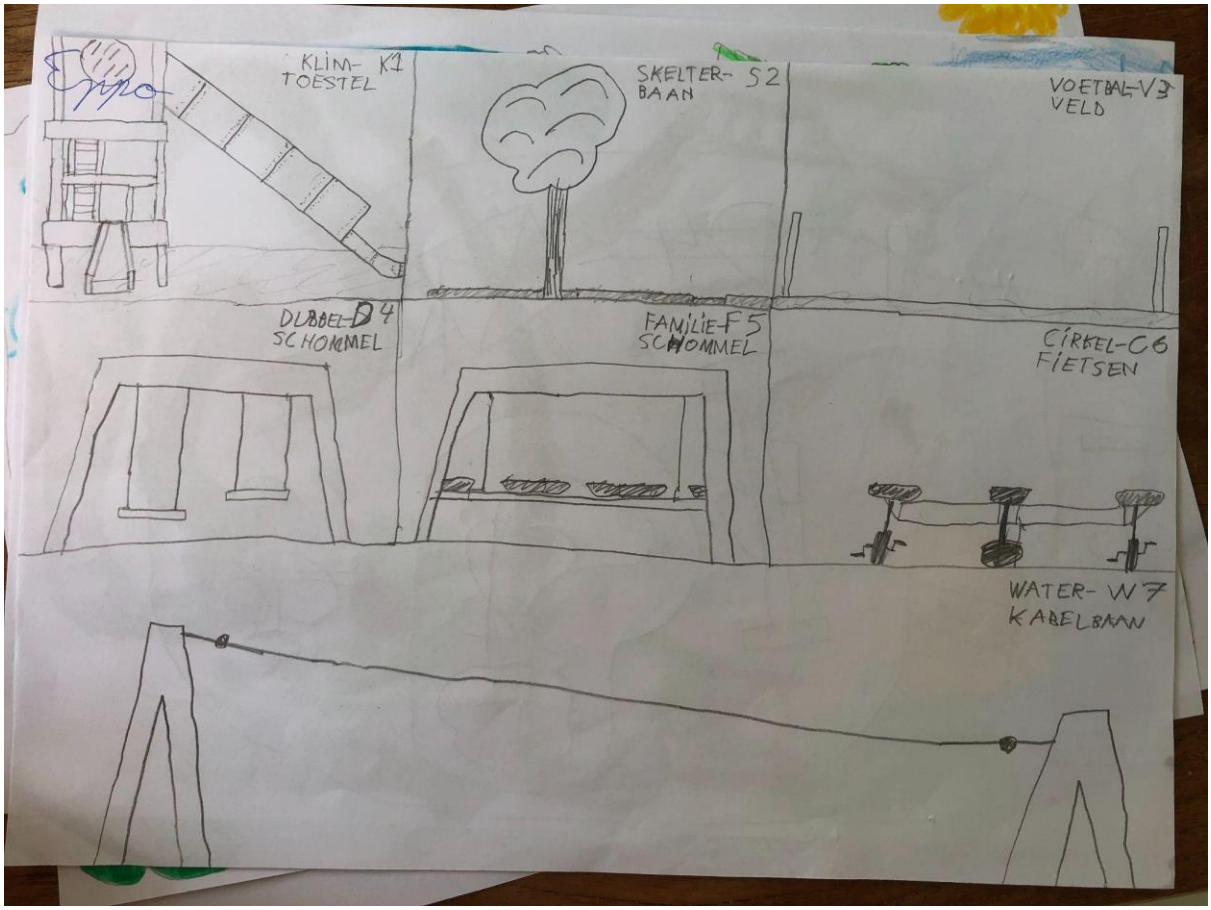

Game rat beveiligings
huisje

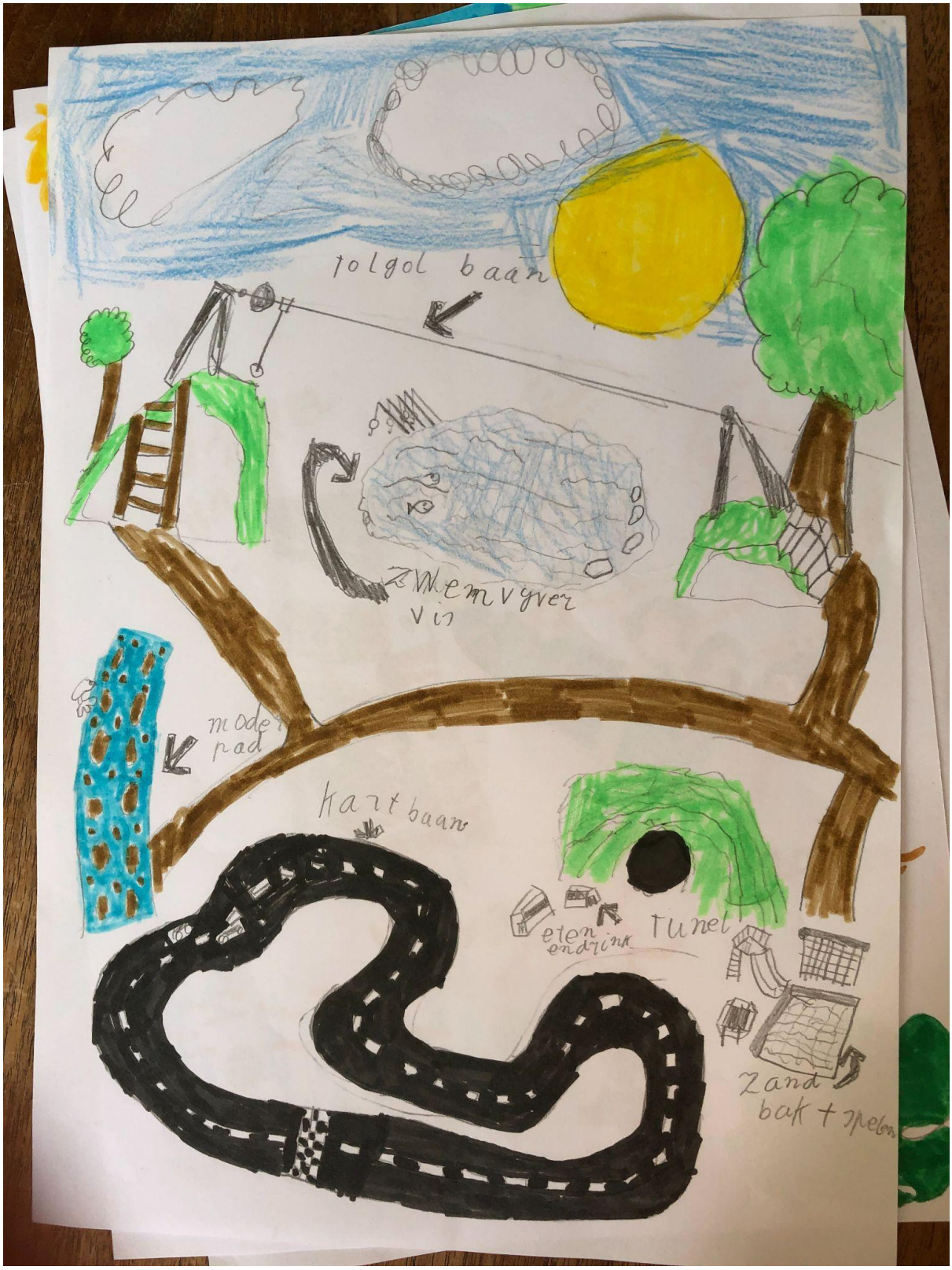

PIT leen
kind
volwwasenen
Joep
Opa
oma
baby


wil ik echt graag
ziplijn
kabel
baan
berg
speel huisje
kart baan (of skelterbaan)


Parkourtje over het water
Zwem Vijvertje
Zwem Vijvertje
Picknick tafel
Picknick tafel
Trampoline
Trampoline
Trampoline
Trampoline
Modderpad
glijbaan
Picknick tafel
brug
Schommel
Takkel baan


TRAMPO
KABEL BAAN
HUT
GAA ZWEMMEN
GLIJBAAN
MINI BOS
BRUG
PARKOURTJE
ZAND
KLIM PAAL


KLIM- K1
TOESTEL
SKELTER- S2
BAAN
VOETBAL-V3
VELD
DUBBEL-D4
SCHOMMEL
FAMILIE-F5
SCHOMMEL
CIRKEL-C6
FIETSEN
WATER- W7
KABELBAAN


tolgol baan
zwemvijver
vis
kartbaan
eten en drinken
tunel
zand bak + spelen

speel huis
Weeeel!!
dat was leuk!!!!!
zand
robot
vijven
huis

Annex 3 - Drawings less privileged children


Vera


t zampii
Lav


Lina


game kat beveiging
huisje