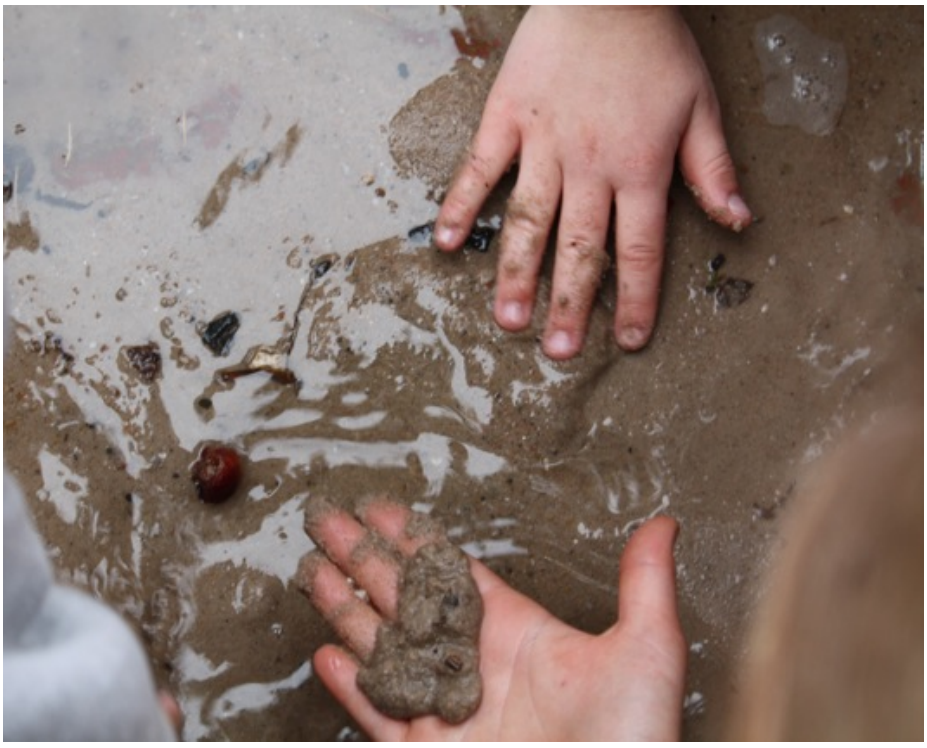
# Place-Based Learning at the Dottenfelderhof: Discovering Soil



By Guy Sidora

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## Introduction

Imagine a young boy of seven years spending a warm summer's day in 1945 helping a neighbor farmer repair a fence that winds through his 200 acre property. As the day begins, the two load the Jeep with all the necessary supplies—wire, wooden posts, nails, hammers and a bag of lunch fort their midday pause. The farmer drives to the top of a nearby hill, parks the Jeep and the two begin to walk the fence line making repairs as they go.

By the time they reach the bottom of the hill, the sun has reached its apex and both men are consumed with hunger so the farmer sends the boy up the hill to fetch the food, an errand the boy is capable and all too willing to do.

"While you're at it," calls the farmer, "grab the bag of nails and a couple new posts. It looks as if one or two might need replacing. Oh, and bring a roll of wire. We'll need that, too."

Suddenly the boy realizes the weight of his return trip and mentions that carrying all those items would be too much for a boy his age.

The farmer, knowing full well the impact of his request, takes this opportunity to offer the boy the chance of his lifetime.

"Well, if all that is too heavy for you, leave it be and drive the Jeep down here."

"Drive the Jeep?! " says the boy, wide eyed and bewildered. "I can't do that. I'm only seven!"

At this, the farmer looks the boy in the eyes and says, “Son, the only thing a man can not do is have a baby. The only thing you lack is the experience and knowhow to drive to Jeep. Hell, I can give you that.”

The farmer explained the simple mechanics of releasing the hand break, how to use the steering wheel to navigate around the boulders and trees and which pedal to use to slow the vehicle to a manageable speed. “You don’t even have to start the motor. Gravity will carry you down the hill. If I can do it, you can do it.” And sent him up the hill.

When the boy reached the top of the hill, he climbed into the Jeep, eyes wide, his imagination brimming with the long drive ahead of him. Everything was where the farmer said it would be. There, on his right, was the emergency break. There, way down on the floor, between the other two pedals he didn’t need, was the one he could use to slow the Jeep if he chose to. And here, in front of him, for the first time in his life, the steering wheel was in his own two hands.

He wrapped his fingers around it and began to trace the giant, shiny black circle until he found himself standing on the seat in order to reach the top of the wheel. And only by standing on the seat was he able to see the farmer standing at the bottom of the hill.

Waving, the boy felt as though he had suddenly grown into the man he always dreamed he’d be. The chance to drive that Jeep had finally come. He sat down, released the emergency break and felt the weight of the vehicle in motion. He heard the orchestra of metal and tires come alive from within the vehicle. The steering wheel suddenly became easier to turn. The entire seat was his. He looked over at the passenger seat, a place where he once sat as a kid and noticed the treetops slowly drifting by. “Yep,” he thought, “gravity is definitely carrying me down the hill.”

He took this time to take in the pilot's view. Everything at eye level looked different somehow. The air vents, the radio, the dashboard, even the horn, which was directly in front of his nose, had taken on a life of its own and he was in charge of it all. He was responsible for the seats, the emergency break, the wire, the posts, the nails, the lunch, the very Jeep he was driving.

In the time he had listed his responsibilities, the lazy drifting trees had increased their pace and it was suddenly clear to this seven-year-old that the time had come to use that middle pedal on the floor. But at seven years old, a child sitting on the seat is not able to reach the pedal with his feet so the boy quickly dove down, head first, and applied the breaks with his hands, successfully bringing the 2 tonne vehicle to a stop.

Now upside down, feet in the air, the boy was faced with the original challenge of the trip. He sprung to his feet, stood on the seat, turned the wheel in time to miss a couple boulders, then back to the brake. Letting loose the brake, he steered his way around some trees then to the brake again. Upside down and right side up, he worked his way down the hill, missing all obstacles and bringing the Jeep to rest at the feet of the proud and watchful farmer whose pride in the boy had grown exponentially.

As the Jeep approached, all the farmer could see were the soles of a seven-year old's feet dangling in the air like two sunflower blossoms drinking the light of the sun. As the boy's face emerged from depths of the vehicle, the farmer's pride was mirrored in the boy's eyes. A sense of accomplishment was bursting from every cell of his young body. This experience had changed him forever and, for that, he wanted to thank the farmer. Not only for the chance to drive the Jeep, and for giving him a chance to find, within himself, that capable boy with his own set of natural abilities innate intuition and pathway to a higher sense of learning.

The boy was none other than my father, Aurthur G. Pech. The farmer's name was Guy. As my father grew to understand the impact of that day in his own life, he decided that his son would carry on the name of the man who changed his life forever. The spirit of that day lives strong within me and continues, to this day, to inspire every decision I make in my life. Leading from the future has never been easier because of a chance that was given to my father in the past. Carrying that spirit forward has never been so important than it is today.

## Secrets to learning

The secret to learning some of the most important lessons in life is to simply be in the right place at the right time. Quite suddenly and without careful planning one can hear, for the first time, a rare birdsong or discover the work of an earthworm preparing to eat a piece of straw. So many seemingly unrelated events must be in order that, for one to create this kind of learning, would seem impossible to coordinate.

Yet educators around the globe seek out ways to create this spontaneity in order for the lesson's impact to take hold and carry the student into new worlds of understanding along new pathways of discovery that last a lifetime.

## Research Question

The questions remain. How does one relate and teach those lessons whose answers are unseen and supersensible to a generation of children whose experience of the world continues to be inundated with physical consequences void of spiritual value? Where, in the circle of this life, does one start?

To answer this question, we begin by examining the foundation of all life on earth. The soil.

Since the introduction of agriculture to the human race, a great and detailed understanding of the rhythms of the planet developed in order for life on earth to sustain itself and continue to thrive. Our nomadic lives where, at last, able to take root in the earth and develop what is known to us today as countries and cultures, building upon the knowledge of ancestors, sharing information, developing foods specific to the various regions on our planet. As humans, we were able to sustain our livelihoods through time; taking command of the space we inhabited and allowing the wisdom of those unseen forces to guide our will.

My intention for this project is to fan the spark of interest in our soil. I want the fire of rediscovery to grow in our children so that future generations can again listen to Earth's rhythms from a place of understanding, feeling the answers from within.

In our current age of information, there are often more questions than answers. Most lessons about our Earth are set in classrooms where text-books and the Internet give our children the only window into the great outdoors. The information is endless; looking at our planet from so many different angles that understanding the Earth seems inevitable. But the missing elements of this kind of education leave every student at a loss for answers when asked how it all works together.

There are teachers who fill in the missing pieces and whose own curiosity was fueled by self-discovery and the wisdom of mentors who found it necessary to pass on the secrets of the Earth.

I interviewed several of these extraordinary people and gained an overview of their experiences both as students of the planet and as

teachers. Their strategies will not surprise many readers but their passion for passing on their knowledge will help the reader improve their own pedagogy for leaving the student with the tools and interest to carry on their own studies throughout their lives.

## Strategies for place-based learning

Place-based learning is defined as a lesson that is taught in the place where the subject matter naturally lives or stands. For example, one can learn more about a farm by visiting the farm than you can by simply reading about the farm in text.

Because a farm depends wholly on it's soil, it is one of the best places on the planet to visit when learning about this amazing organism. I found in my research that people were being more descriptive when it came to teaching about soil. Using the words 'organism' or 'living Earth' to convey the sense of the soil as a living thing rather than something you simply wash off your boots.

"You do not feed the plants, but cultivate a living soil.", says Linda Jolly, director of a school-farm cooperation in Norway. "Understanding the living soil is the basis for organic gardening and agriculture so that a "matter-of-fact" familiarity in the relationship to the animals and the work at the farm could arise."

This familiarity takes time and because the students are spending this time on the farm, they are able to use all of their senses to assimilate the constant flow information, rooting their knowledge in a visceral experience rather than a cognitive one alone. As part of her pedagogy, Jolly and her colleges have created a ten-year program where children take part in the development of the farm and the propagation of different

plants each year of their involvement. The young children start growing grains, the next class potatoes and so on until age 15 year where kids are harvesting timber from nearby forests.

"Some of the topics from the lower grades are renewed and widened. For example, the 8th class has sown, harvested and threshed grains they grind to flour in a restored water mill.

The theme of grain is thus extended to water-power, an important source of income in the valley. Retired farmers have contributed with knowledge about threshing and milling of grains and power plant workers take the pupils on guided study tours of the modern power plant. In turn they are invited to breakfast with rolls from the pupils own production."

Another example is given by Dr. Aksel Hugo, associate professor at the Norwegian University of Life Sciences whose extraordinary interest in soil development was fueled by his professor's willingness to crawl through the mountains on his hands and knees for a week rather than walk, setting an example that Mr. Hugo carries with him and gladly offers as one of his most beloved experiences.

We keep coming back to this word 'experience' when we explain the study of soil because, like the boy in the Jeep, it's the reality of a situation that allows us to remove the filters and blockages that might otherwise get in the way of our deep appreciation and willingness to learn and develop our own conclusions through the use of all of our senses.

So how does one accomplish the task of creating this experience for children who have little or no tactile experience with soil? More importantly, is it possible to shift a child's perception from "dirt is dirty" to "dirt is soil and soil is life"? The most dynamic teachers I've talked to were turned on to agriculture and soil science by people who modeled some

passion for the subject like Dr. Hugo's professor. You can choose to wash the dirt off your boots or turn the boot upside down and look it through a magnifying glass.

When you work with children and the soil, you have to create an experience where the adult is showing their love for the soil. You can't do it intellectually. When the children see the farmer tending to the soil, you don't have to explain anything.

Also children must have time to discover the soil for themselves, to find in the soil those living organisms that call the soil home. This study in biology can be magic for kids. Discovering the world that exists underground builds yet another fascinating picture for children.

For those who have been trained to believe that bugs are scary, the teacher must always offer matter-of-fact guidance that the soil is home to millions of species who are part of that increasingly valuable circle of life. These creatures have been living under your feet and have been part of the soil building process for eons.

The role of the teacher in the current educational climate is not only one of passing along facts and figures but one of debunking rumors and myths that sometimes are set fast in the minds and hearts of students. What's more, it is the responsibility of the teacher to break the habitual behaviors of children who have come to disregard and disrespect the ground they walk on.

On one of my Boden Tours a child made a pistol out of the Ton (clay) I was showing and began to 'shoot' his classmates with it. To me, this was a behavior that needed to be stopped and reversed. I took that moment to stop the boy and explained quite urgently and compassionately that the earth is something that is always giving back to the human race not taking

life away as he was pretending to do. From my stand as an adult, his 'play' had huge implications. Little boys are somehow wired to hit each other with sticks and shoot each other with pistols but this behavior can be stopped with careful awareness and the courage to redirect the energy. When I did so the three adults who accompanied the class were impressed enough to thank me. In my mind, there was no room for apologies. Those who love the Earth must take every opportunity to defend her right to live and thrive.

Every child and those who were children at some point in their lives each have a very different experiences with the soil they tread upon. To make a sufficient shift in a student's respect for the Earth, the teacher must bring all the wonder and spiritual reality to the forefront of the lesson.

Whether it's an hour-long Boden Tour or part of a ten-year program, there must be a sense of beautiful urgency when we speak of the soil no matter what the initial feedback may be. We must remember that the subject of soil gets washed down the drain with liters of non-biodegradable soap all to often. It is our responsibility to treat the subject as if it were the most important foundation we have on Earth because as a matter of fact, it is.

## Tools For Success

So what can we, as educators, do to make the kind of impact that will stay in the minds and hearts of children? What kind of special materials are at our disposal?

It is remarkable how easy it is to gather the right supplies. But, again, the most difficult thing to find, for most people, is the time it takes to teach about the soil. But let's assume you have the time and you have created a program that brings the kids together on a regular basis to watch the

development of the soil. The following are a few ideas from programs that are going on around the world.

### Bad Vilbel, Germany – Dottenfelderhof

We start with people who were once children and who, throughout their lives, have developed a love and sense of wonder for the planet they live on. The year-long Landbauschule program offers its students a unique opportunity to shadow farmers who study and apply the principles of Bio Dynamic farming outlined by Rudolf Steiner. Naturally, there is a lot to learn and the students are required to bring with them a significant amount of previous agricultural experience.

None-the-less, there is not enough time in a day to write down everything that this program has to offer due to the sheer volume of information passed on to the students. However, one of the most impactful activities throughout this remarkable year is the daily walk through the farm with Herr Dieter Bauer.

From March through April the students view the world through nothing more than a 3X-6X magnifying glass, following the development of individual tree buds, fruit buds and vegetative buds, marked with string, as they open and stretch themselves into life. This daily awareness changes the students forever.

Not only by the assimilation of the information about the plants and trees but the respect for the way things grow and the understanding of the unseen forces that affect the lives we lead. Even those who have little or no command of the German language gain such a deep appreciation for this astounding rhythm that language barriers suddenly disappear. It is remarkable that one small plastic lens, coupled with the time it takes to

observe, can open this kind of pathway to understanding something as complex as the development of the world around us.

### Aurland, Norway - The Farm as a Pedagogical Resource

One of the pioneers of this program, Linda Jolly, speaks about the shift in her students' awareness of the soil as though she were talking about God himself. I caught up with Linda in Dornach at the Agriculture Conference in February. When I posed the question of Tools for Success, she rapidly replied, "Earthworms and a shovel!" It seems that when Linda takes a shovel full of dirt in her hands and shares it with her students, she is building a bridge between the soil and the kids that can never be burned. "Earthworms are such an integral part of our ecosystem and when the students start to care for them, they see very quickly that they are caring for the Earth and soil at the same time. The students become part of a that web of life." Earthworms are perfect little teachers because they move through the soil with such ease, they compost the food we feed them and they enrich the soil by creating the lungs of the Earth and castings rich in essential minerals.

The soil as a living organism can sometimes be too abstract an idea for children (and adults) so Earthworms become the bridge that fills the gap between dead soil and living, organic matter.

### Aas, Norway - Dr. Aksel Hugo

Another example of Place-Based learning where being in the right place at the right time can illustrate processes that started a million years ago is that of Dr. Hugo who studies and teaches the development of soil. His approach to teaching this immense topic is simple.

"I search a site where there is a gradient from barren rock (only with lichens) - lichens with moss (thin 2-3 mm soil) - moss (5-10 mm soil) -

moss with grass (50 mm soil) - and grassland (500 mm soil). In Norway we have such sites often in a field or in a forest where the barren rock mounts up through the soil layer. I tell them how it looked before the place got "dressed" after the ice pulled back with barren rock up there and some sediments down in the slope there - When we have finished they see the "dressing of this site" - they see where it came from and where it is going. In this process I also make sure that everyone in the group has had placed some of this magic stuff (soil) in their hands firmly - so they connect their hands and fingers and nose."

Dr. Hugo always stresses the DYNAMICS of soil development. "Think of a film that is rolling for 5000 years taken from a helicopter above - you will see the lichens slowly cover the rock (20 mm growth per 100 years) and when the lichens have come, the moss can grow on the lichens - and then the grass onto the moss - etc. They learn succession also. "
Dr. Hugo explains that this part of his lesson normally takes only about 10 minutes but when he finds the right place where he can climb on the 5000 year-old 'stage' and place the soil in the hands of his students, he can guarantee an unforgettable lesson.

The farm offers a similar stage for the students that no other place on Earth can provide. Here real life processes are happening at all time. Everything from the birth and death of animals to the growth and decomposition of plants can be observed on the farm. There is plenty of room to move and get tired, exercising the body and the brain at the same time, making learning easier and more fun. And since children live in the moment, there are plenty of impressions for their senses—the sun, the wind moving across the fields and playing through the crops, the rain that turns children's faces toward the sky, the cozy heat they experience in the cow barn. No amount of words can give children this kind of foundation.

## Success Stories

These lessons are unforgettable for the teachers as well as the students. It is possible that every teacher has a favorite success story to tell. I asked my group of interviewees to share their experiences and this is what they said.

### Linda Jolly

"I remember one boy who was never very excited about the work in the gardening lessons. He complained about being exploited, among other things. A couple of years later I met his mother and she told me that at home he had dug up the whole lawn and planted potatoes! So he had learned something! Another young man who is working as a journalist and photographer told me that he longs for the work with the compost, seeing the changes from year to years and feeling it with his hands."

### Dr. Aksel Hugo

"I love it when the students understand that it has taken 5000 years to build 5 mm of soil—and when we have opened up a small piece of soil, they will—after having connected themselves to this fact—always make sure that the little piece is put back again and not just lying lost there on the ground. I love how soil teaches reverence for the unseen that is holding and carrying all life process"

### Daniela Born-Schulze

"The entire cycle of life is here on the farm. You can trace everything back to the soil within a few hundred meters. The bread that the kids eat for lunch—the Backhaus that bakes the bread —the flour they use to bake the bread—the mill that grinds the wheat to make the flour—the plant that grows the wheat—the soil where the plant grows—the Earthworms that amends the soil.

The cheese is on their sandwiches—the milk that was used to make the cheese—the cows that produced the milk—the farmer that milked the cows—the grass and hay the cows ate in order to make the milk—the soil where the grass and hay grew. The students are able to take the soil in their hands, look at it, smell it, taste it and discover for themselves, in the place where the soil lays, what lives there and how connected it is to the greater whole."

### Martin von Mackensen

Martin is an extraordinary teacher with an ability to pull many facets of life together and create an understanding of very complex ideas. Martin likes to take one being that lives in the Earth, the Earthworm for example, and talk about it as though he really loves it (which I'm sure he does).

He talks about how it cleans its canals by moving through them, what it likes to eat and how it creates new soil for the farmer, spaces for the Earth to breathe, for the roots to grow, etc. and the children get the sense of wonder and believe that, "wow, he really does love this Earthworm. It must really be a very special thing!"

Another strong example is how roots start as these as soft white roots that grow such a strong taproot they are able to grow through the asphalt in the road. In a way, children have the same strength and will to grow, always looking for the upright and growing no matter what. It's important for the teacher to know what kind of an image they have of the soil throughout the seasons. If they have a clear picture, the children can pick up on that with their hearts, no explanation necessary.

### Beate von Mackensen

For years, Beate has taught children in the Waldorf environment. One of her favorite experiences that continues to thrill her as she watches the children is when they harvest potatoes. They spend time digging in the soil which they really don't completely understand, their fingers get black

and sore, then suddenly they open up that part of the soil where the potatoes have been growing. It is such a wonderful surprise for them that it creates for them that lasting impression they carry with them for the rest of their lives. Instantly they can indentify with the experience by doing without any cognitive exercise at all. They get to connect their work with the soil to the harvesting of a living plant that has grown food for them and that is magic for children.

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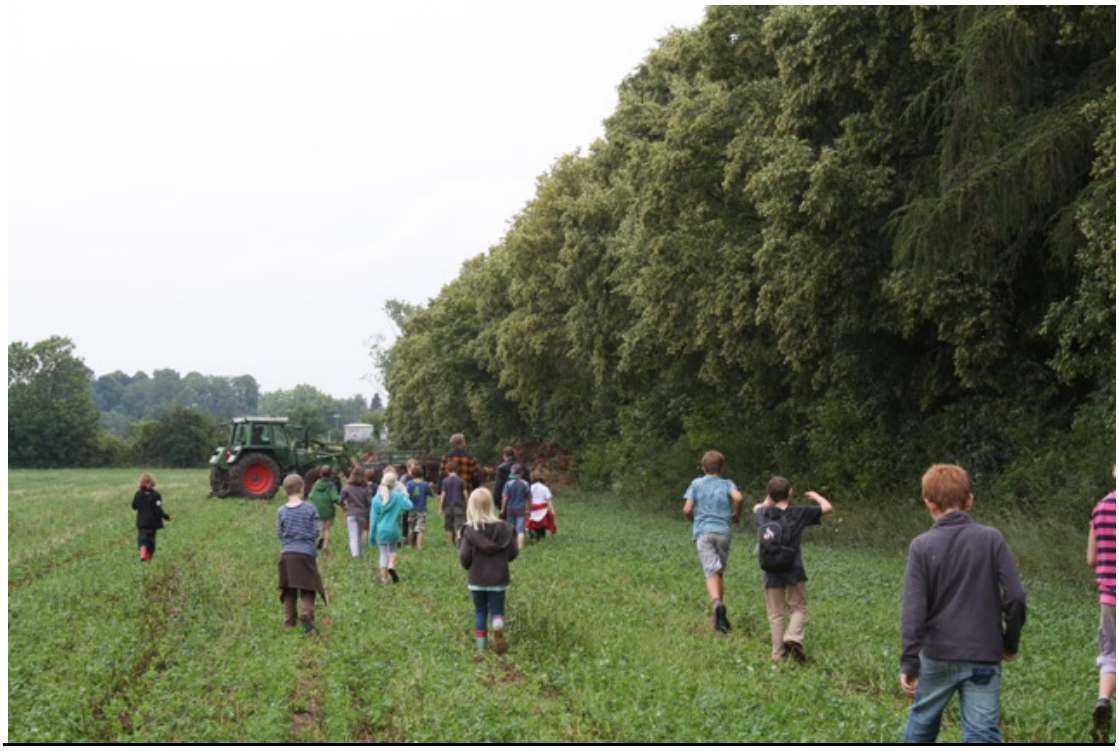
In the current age of quick fixes and immediate gratification, the challenge of teaching lessons on the unseen world can be challenging. But look at mathematics, for example. Children begin with counting real objects, identifying numbers and eventually are able to conceptualize the process of adding, subtracting, etc. Children must be able to follow the logic of mathematics, trust that the process will lead them to a concrete solution.

The same logic applies to the development of soil. Students must be able to add the components together and discover for themselves the total substances that make up our soil. Earthworm castings, vegetative substances, water, warmth, air, movement, human impact and, most importantly, time—all add up to the very foundation we call soil.

The easiest way to illustrate this process is through the development of compost. “Nothing beats composting!” says Linda Jolly. “When they [the students] have been through some cycles with the compost piles, then they know something about soil creation. They also experience the life of the soil very dramatically when they are turning the compost. I also keep near by because I know they will come running all the time with what ever they have found of organisms in the compost.”

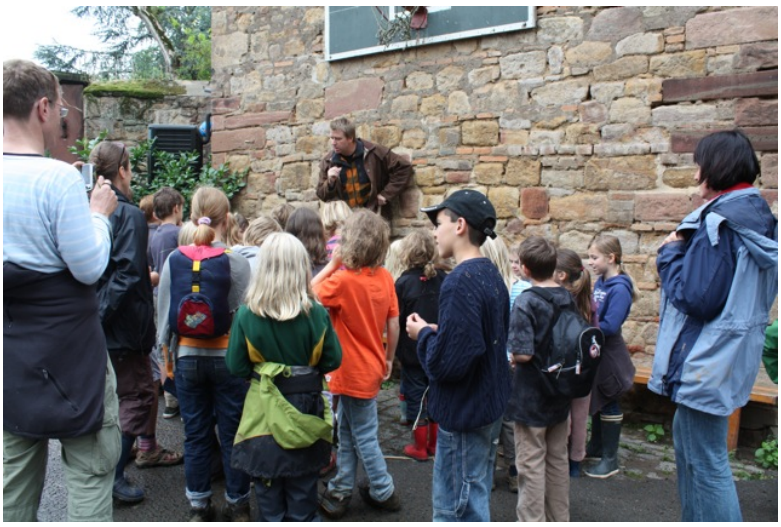
## The Boden Tour



In an effort to teach these concepts to children myself, I chose to develop a learning station for our Hoffest at Dottenfelderhof. The activity took the form of a Boden Tour designed to lead the classes through the entire cycle of soil development. The following is a rundown of each station on the tour.

### Introduction – Welcome

> The first minutes of meeting a group of students are the most important. I always ask questions about their experience on farms, allowing them to share with me how much they already know and giving me a chance to find out what they're interested in learning. Children don't ask too many questions, so I suggest things that might interest them according to what might be happening on the farm that day.



## Awareness of the Unseen – Listening in the Old Saal

In the minutes before children arrive on the farm, there is a silence that fills the air that is only broken by the occasional voice of an animal or song of a bird. Many times a piece of motorized equipment makes its way through the courtyard, but is promptly gone leaving the silence to reign once more. Then, in the distance, one can hear the group of children walking onto the property. You can hear them up to a quarter kilometer away before you ever see them. The children arrive without ever knowing the normal state of things on the farm. It is in this silence-before-the-storm that the real farm thrives. It is am important state of things so it is important for the children to get a sense of it while they visit the farm.

The first activity I do with the children is gather them in the Old Saal and ask them to identify the sounds they hear around them. We start with the whispering voices of children not quite focused. Then, in that stage of silence, we can hear the sound of clothing and shoes moving as the children shuffle around. This stage creates a stillness in the group automatically. Then our focus reaches through the closed doors to what might be moving outside. Farmers walking

through the courtyard, a tractor, horses, cows, pigs, people calling after each other. Here in Frankfurt there are more often airplanes flying through the air and in the stillness creates by this activity, the group can sense their movement as well. Then I point out how far away these various targets are moving: ten meters, twenty meters, nine thousand meters! The children are always amazed at what they are able to hear at such distances.

I then explain that there are many things on the farm that they will not be able to see with their eyes but that are present nonetheless. "Would you like for me to point them out when I notice them?" They always say yes, eager to follow my lead. I always tell them of the special nature of the farm and give them easy signals to follow as we continue on the tour.

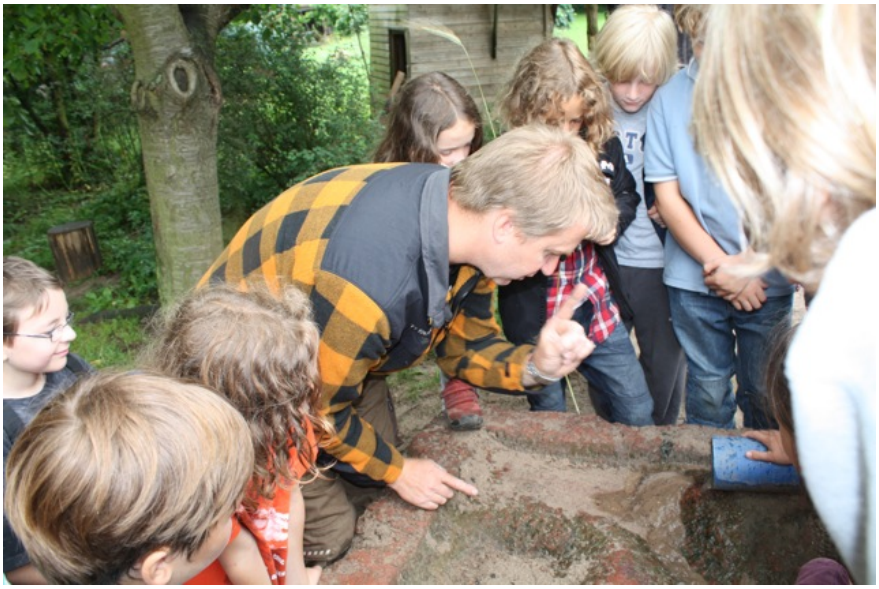
### Dirt vs. Soil – To Wash it or Watch it. That is the question.

As we move to the playground, I open a conversation about dirt with questions like, "What is dirt?" "What's the difference between dirt and soil?" "How long would you be willing to leave soil on your hands before washing it off?" "How long would you leave dirt on your hands?" "How dirty must you get before you feel like you have to wash it off?" "What kind of dirty do you like: sandy, muddy, sticky?" "What do you use to wash it off with?" "Where does all that dirt go when it disappears from your life?" The answers always surprise me. "My mom makes me wash before I eat." "I take a bath every day" "I hate getting dirty." "I love getting dirty!"

Two things are happening with this line of questioning. I want the children to become aware that soil moves from one place to another by different means AND to make the distinction between the **dirt** they are used to washing off and the **soil** I want them to love.

## Soil in Motion – Introduction to Soil History

An introduction to the history of soil is illustrated perfectly on our playground by using the water pump to run water through the various levels of waterways.



This is a great visual for the children to see how water carries soil from one place to another.

Another example is holding a handful of sand in my hands and asking several of the children to blow the sand out of my hands in the direction of my clothing. When the sand has disappeared, I go through the many folds in my shirt and pants to find the many areas that the sand has landed, illustrating the force of their efforts and the random real estate the sand now inhabits.

As I walk away, sand continues to drop from my clothes. I point out that humans also play an integral part in the displacement of soil on the planet. The sand, for example, was brought here by truck. The water is pumped by human power from a holding tank under the ground. The grooves in the children' shoes are filled with sand that

they now carry with them toward the next station. Where ten minutes ago the sand was there, now it is here. A history continues to reveal itself with the help of these three elements.

## Search for soil – What do you see?

Now that their eyes have been focused on the difference between the types of soil, we are on the look-out for it on our walk through the courtyard. Naturally, in the paved areas, soil is sparse and reduced to what has been contained in planters and flowerbeds. These areas are always filled to the brim with vegetation so it's not until we get to the house garden that soil can be clearly seen between the rows of Maize.

Now the children are actively looking for soil, not dirt; a clear shift in their intention.

## House Garden Soil and the search for Earthworms

This is the first place on the tour where the kids hold in their hands the soil from the house garden. From a place under the Maize, they can clearly see the difference between the "dirt" they saw before and the **soil** they hold now. We explore to smell, the texture, the presence of vegetative material, the color, the sound as we move it between our fingers and I show them how to "taste" the soil highlighting the way it feels between their teeth.

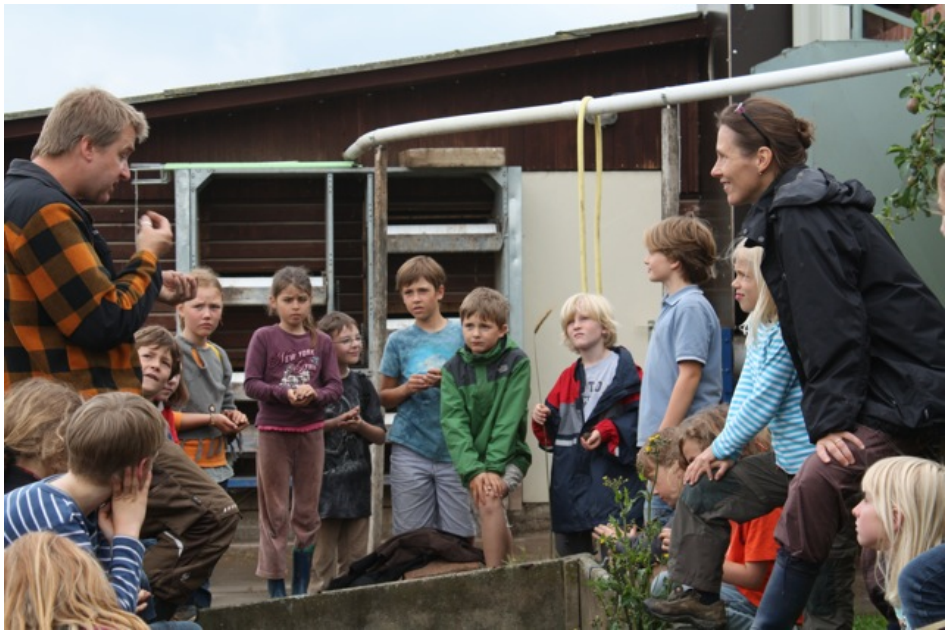
In the shovel-full of soil, we search for Earthworms and find two or three in that particular block of soil.

Then we move to where the soil has been heavily amended with compost, a place where the farmers propagate new starts for the garden. In one shovel-full of soil, we find at least thirty worms. We compare the soil from what we looked at under the Maize and find that the Earthworms seem to thrive in the soil that has more food for them to eat. That brings up the question of Compost vs. Mist.

## Compost vs. Mist

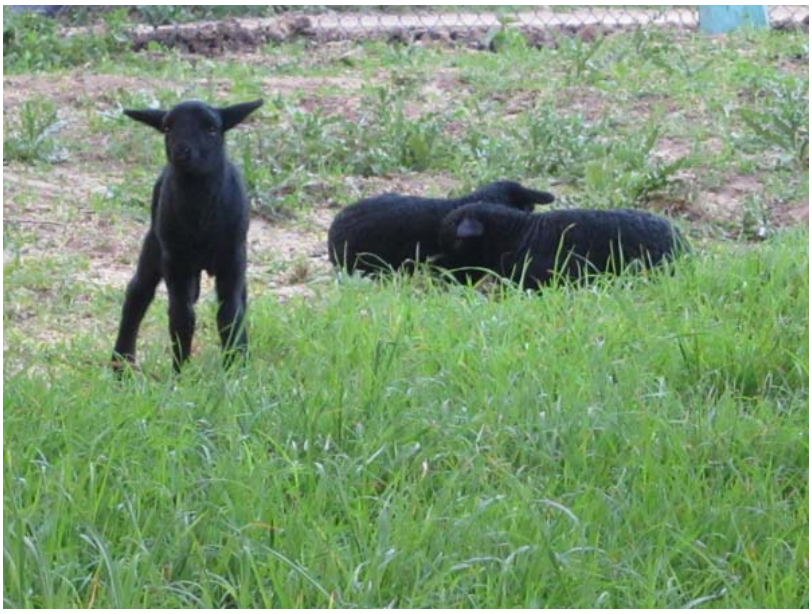
What is compost? The kids were quick to say, "Shit!" I was just as quick to define the difference between Shit and Compost making it quite clear that you can't have one without the other and encouraging the children to realize the difference.

When we think of Shit we usually move away from it but when you're making compost for your garden and fields, you need to collect the Mist and combine it with organic matter to make compost.  So if you make a clear distinction, you'll have a better relationship with both components of compost.  Besides, the cows work so hard making Mist it would be a shame to let it go to waste.



Giving the compost its due respect, I explain to the children that compost is the farmer's gold and a very important part of soil development.

## Sheep



As we move along, we pass the sheep quietly grazing in their enclosure. "Sheep depend on the grass they eat. The grass depends on the soil it grows in. The soil depends on the compost we feed it. Without soil, we have no sheep."

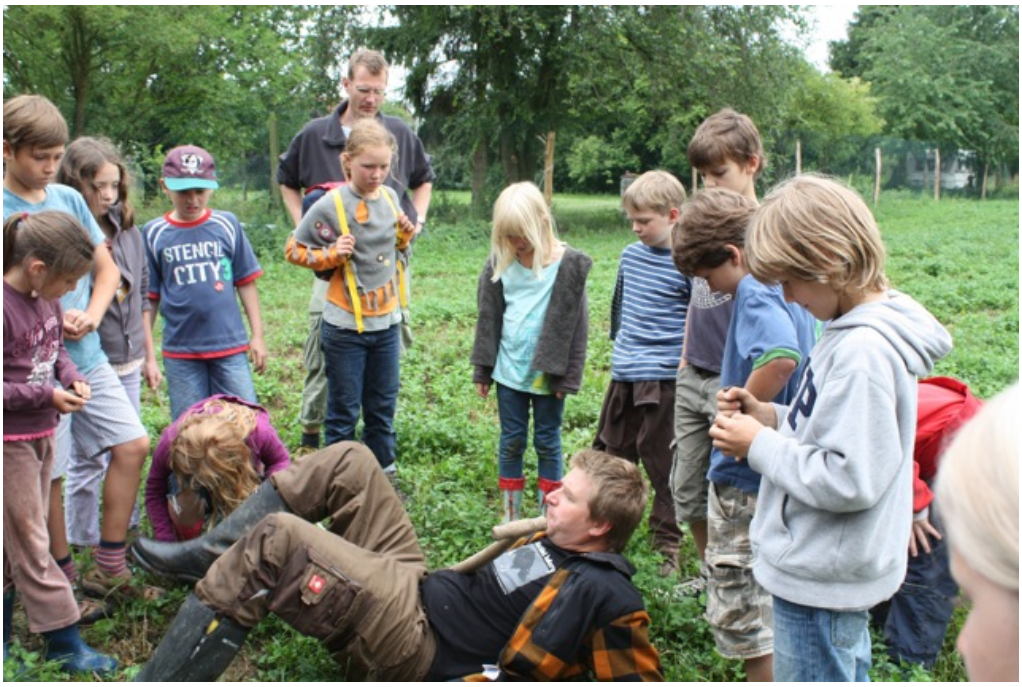
## Bees

At this time of the year, the bees were busy collecting pollen from the trees that we passed on the tour. I stopped the kids and asked them to listen to their surroundings like we had done at the beginning of the tour. They quickly picked up on the buzzing sound of the bees overhead.

"The bees are collecting pollen from these trees for their livelihood and the production of honey. No soil, no trees. No trees, no pollen. No pollen, no bees. No bees, no honey. No honey, sad children everywhere!!"

## Earthworms In the Field

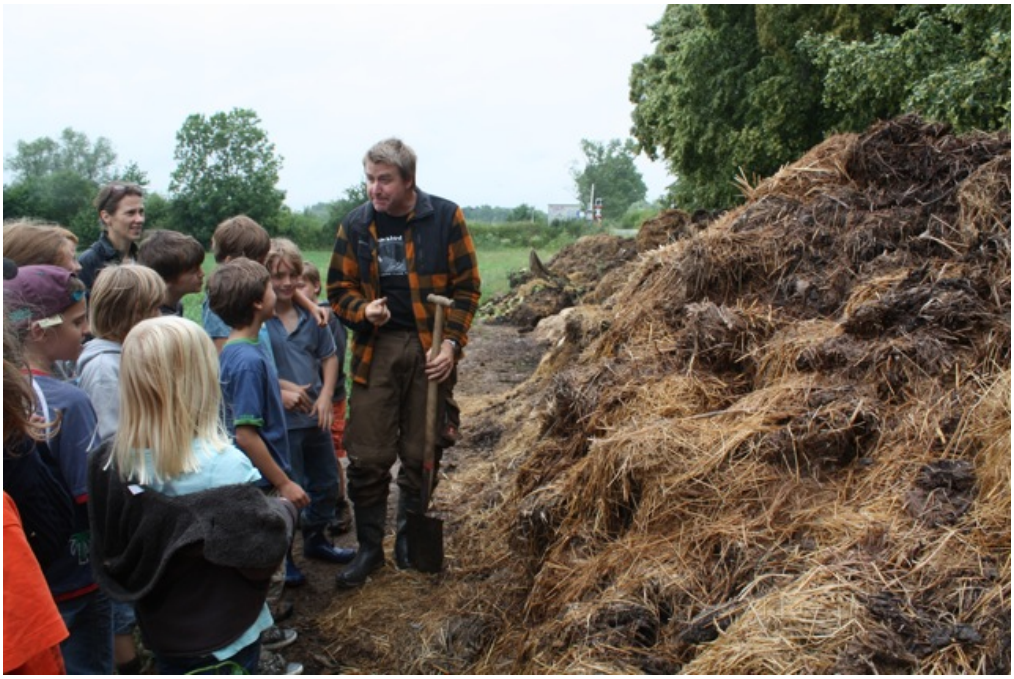
I find it remarkable that the soil is everywhere and yet it is so very foreign to people. I asked the children to lie down on their backs and feel the Earth beneath their backs.



A few followed my example, but the clover was a little wet so I didn't insist. Instead, we looked for Earthworm castings and the holes where the Earthworms came up to eat. We looked at the difference between the casting and the soil and discovered that both were similar in color but different on consistency. I explained how the worms make the castings, an explanation that followed the Mist theme quite nicely. By this time, the children seemed to have gained a healthy respect for Mist and didn't react as negatively at the thought of worm Mist as they had with cow Mist at our last station.

## Compost – Pile of Gold

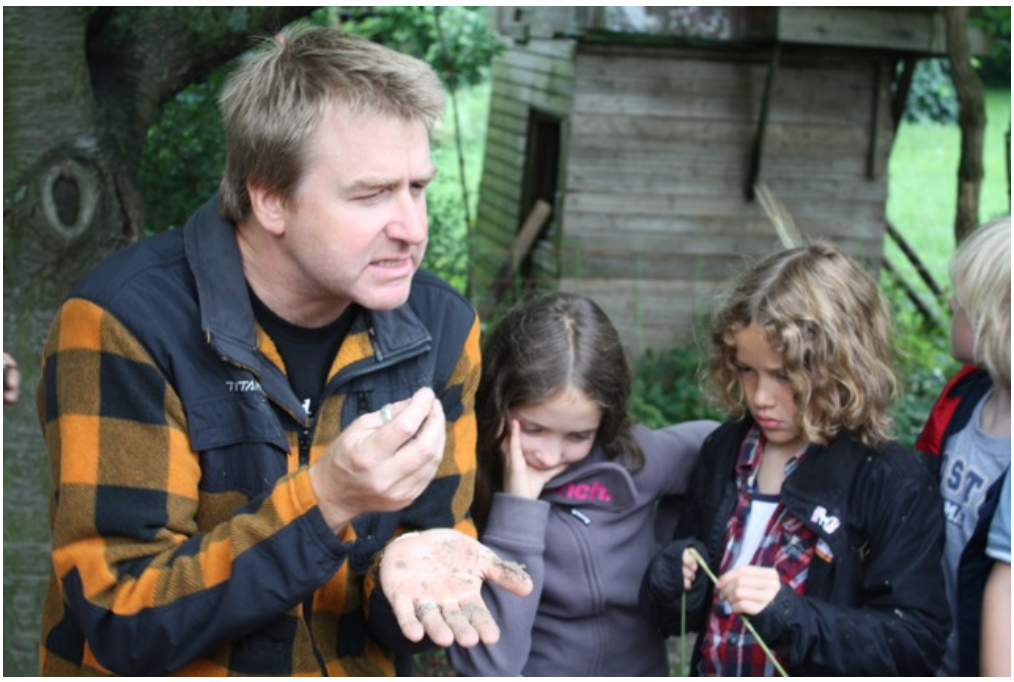
**Section One** – The fresh scent of cow mist was overwhelming for most children on this tour. However there were a few brave kids who were able to take some mist in their fingertips and examine the consistency and the smell at close range.



I encouraged the adults on the tour to follow suit since it was the children who were brave enough to get that close. I told all the children to remember the scent of the pile at this end because the environment of the compost pile was going to change as we moved along its 200-meter length. The children gladly welcomed the change.

**Section Two** – Heat and Air were the themes for the halfway point of the compost pile. I dug a deep hole in the side of the pile, letting the steam escape from the pile at the children's amazement. "Why did we not see this steam before we dug the hole?"

I explained that the pile had developed a sort of 'skin' that had already lost much of its water content that sealed the rest of the pile so that the heat could continue to break down the material within. Each student now was willing to hold a piece of the steaming compost. They remarked on its heat, the lack of Mist smell and the amount of creatures already taking residence in this part of the pile. "Wait until we get to the end!" I said with wonder in my voice and we raced to the end of the pile.



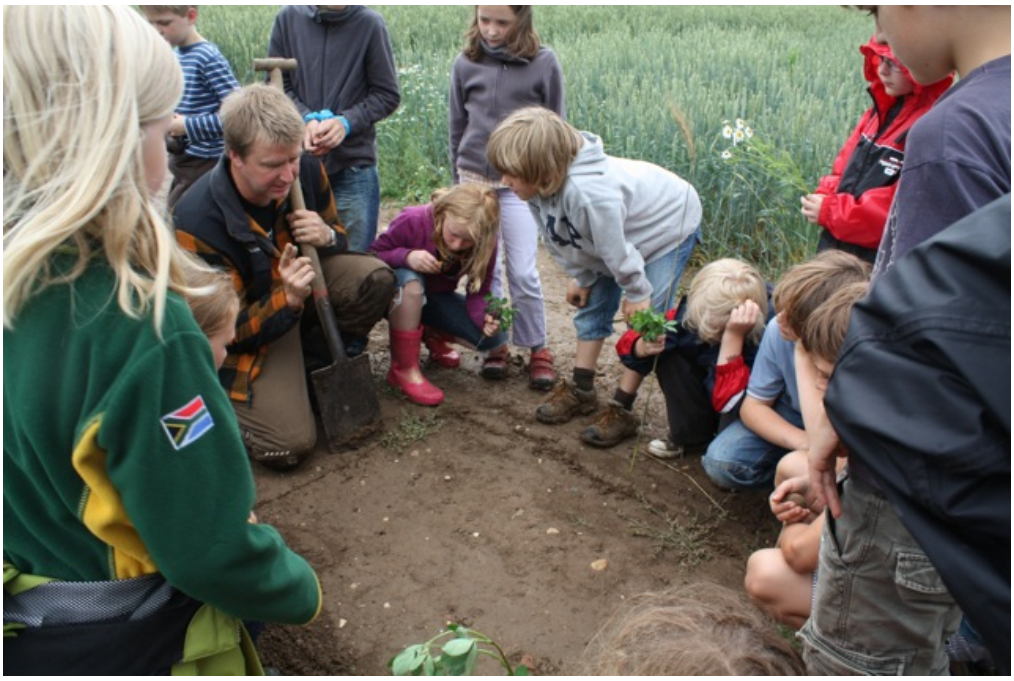
**Section Three** – Another hole was dug, students taking turns on the end of the spade. There was "New Soil" already developed here and it was clear to the kids that the color, texture, smell, the warmth and inhabitants had changed. Even the shape and size of the pile had changed from that of the beginning.

## Comparing Soil Water Content

I wanted to show the children how the water in the soil was being used by the crops that were planted on either side of the field. Where nothing was growing, the soil was moist and soft but on the other side of the road, where the grains were thick, the soil was a lot drier. This was just a quick side note about the movement of water as it traveled into the plants.

## Earthworms in the road

As we made our way along the road to the hole I had dug to show the layers of soil, I noticed that it was pocked with Earthworm holes.



I drew a square with the end of my spade and asked the children to tell me what they saw. They were quick to arrive at the fact that there were dozens of holes in the ground. Some kids started counting, others were on their knees looking inside the holes to see if they could see the worms inside. "Let's see just how deep these worms travel. Follow me."

The Hole

# Der Boden: ein großes Erinnerungsprofil

### Boden erzählt eine Geschichte

Vor langer Zeit stand an dieser Stelle nur Wald...
Es war kaum ein Durchkommen, so dicht waren Bäume, umgefallene Stämme und Dickicht verwachsen. Es war dunkel und kühl.

Der Boden unter dem Wald wurde sauer, Tonminerale lösten sich dadurch und das Regenwasser wusch immer mehr Ton in tiefere Schichten.

Die Nidda war nicht kanalisiert und jedes Jahr gab es große Überschwemmungen. Der Fluss brachte so neue, fruchtbare Erde aus der Wetterau. Langsam sedimentierte sich eine neue Schicht guten Bodens.

Später wurde die Nidda kanalisiert und tiefer gelegt. Die Menschen fällten den Wald. An seine Stelle traten Wiesen und Weiden.

Heute pflügen die Bauern des Dottenfelderhofes regelmäßig den Boden und bringen Kalk und Mist auf die Felder. Der obere Boden ist dadurch dunkel und locker geworden und die Regenwürmer sind zahlreich.

### Was siehst du?

Der Boden hat verschiedene Schichten. Kannst du sie sehen? Wo ist der Boden heller, wo dunkler? Welche Farben siehst du?

### Hast du Fingerspitzengefühl?

Um mehr über den Boden zu erfahren kann man ein erbsengroßes Stück feuchte Erde zwischen den Fingerspitzen rollen.

Reißt und bricht der Boden bei jeder Verformung? Dann enthält er wenig Ton.

Oder lassen sich dünne Würstchen rollen? Diese Plastizität ist ein Zeichen für mindestens 30% Ton im Boden.

Echte Bodenforscher brauchen noch feinere Wahrnehmungen und benutzen sogar ihre Zähne, um Boden zu beurteilen: Zerreibe etwas Erde zwischen zwei Fingern, bis nur noch etwas Staub bleibt. Blase den Staub von deinen Fingern und lecke mit der Zunge das was in den Hautritzen deiner Fingerspitze zurück geblieben ist. Knirscht es jetzt noch wenn du deine Zähne gegeneinander reibst, ist das ein Zeichen für Lehm. Fühlt es sich aber an wie Quark, so ist das der feinste Anteil im Boden, der Ton.

### Oberboden (0-38 cm)

Humosloser, lockerer Lehm, vielfältiges Bodenleben.
Wird reglmäßig gepflügt und Planzenreste und Kuhmist werden eingearbeitet.

### Tonverarmung (bis 62 cm)

Tonminerale haben sich aus dem sauren Boden gelöst und wurden mit dem Regenwasser ausgewaschen, es bleiben nur noch 17% Ton.

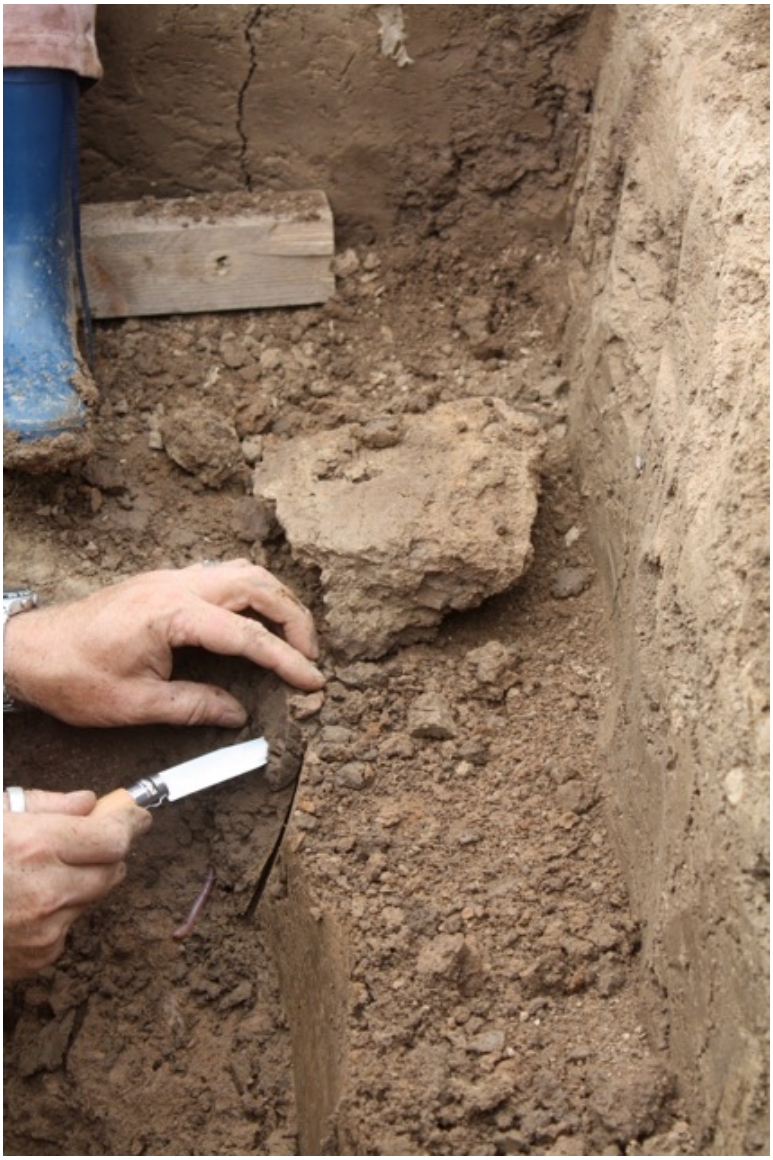
### Tonanreicherung (bis 90 cm)

Hier hat sich der Ton abgelagert. Der Boden ist kräftiger gefärbt, denn er enthält 35-40% Ton.

Dottenfelder-hof

We arrived at the Hole. I had left four terraces at each soil horizon. On each terrace were Earthworm holes just as we had seen on the road so the children were able to get an idea of the depths at which these creatures traveled. There was even a piece of straw sticking out of one of the holes, having been drawn inside by an earthworm overnight. The children had the chance to crawl down into the Hole and experience the temperature difference, the smell of the soil and the difference in moisture.

I encouraged them to try to make an Earthworm from the soil at each of the four layers by rolling a piece of soil between their fingers. They found that the Ton (clay) layer was the only layer where the soil held together. I encouraged them to taste the soil using the technique I had shown them earlier. I brought to their attention the dry soil on top of the ground in contrast to the wet, sandy soil at the bottom of the 100-centimeter hole.



Then reminded them of the activity we did in the playground where the soil had traveled from one place to another. The soil they were playing with at this moment was brought here from quite another place indeed.

The tour took about 90 minutes. In that time the children were exposed to quite a lot of information wrapped in a whole lot of fun and animation.

It is important to realize that at each and every stop in the tour, my energy and sense of wonder was very high. I kept their attention by my involvement in the subject matter and my love for the Earth.

I taught by doing and by showing and was never in need of a stern voice or the use of disciplinary action. The kids were thrilled to be in the open air with room to move. They could feel the wind in their faces, the cool air around their heads, the Earth beneath their feet and the freedom to soak in the experiences, even the unseen ones I had planned for them. They were having fun.

## Conclusion

As educators, we need to be extremely clear about our intention. What is it that we want the children to take from the experience we design for them? What do we want them to carry forward by learning our lesson? When it comes to teaching children about the soil, we must carry the energy and reverence for it in our eyes and in our hearts. The tone of our voice says more about how we feel about the subject than the words we use to describe it.

Changing the way children look at soil is not impossible. Like the boy in the Jeep, there is a sense of urgency as we take this journey but as long as there is movement, the journey will come to end and everyone will be fed. When we, as educators, use the right tools to maneuver the obstacles and let the gravity of the situation move us forward, the children will be impressed by our own reverence and love for the soil that covers this majestic Earth of ours.

Prepare your body for good teaching. Get plenty of rest and eat good food. Your tired voice would be taken as a lack of interest in the subject matter. It's up to you to revive the spirit of the soil.

Now go get your hands dirty!

## List of Interviewees

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