

WORKSHOP

Into the woods of time

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Introduction

In this document you can find the workshop that was developed for 'Innovation in education (Research Lab)', a course unit of the Thomas More University in Vorselaar.

In the paper that was made together with this workshop, you can find the results from a research about the perception of time of children and ways to improve it. In the document, you will find the definition of radioactive waste with theoretical support. Lastly you will find who NIRAS is and what they do in their project 'Tabloo'. The compilation of this information results into the workshop that you can read here.

The project was made in collaboration with NIRAS and their new project 'Tabloo'. NIRAS, National Agency for Radioactive Waste and Enriched Fissile Materials, is responsible for the management of radioactive waste in Belgium, for present and future generations. They think and work about the management of radioactive waste in the short and long term. At NIRAS they take care of radioactive waste that needs a short time to become more stable and safer for human being.

'Tabloo' is a new project of the institution. They intend to have a community centre accessible for all people. In the building, there will be all kind of rooms from information points, to a theatre and even laboratories. There will be an expo about radioactive waste, time and the control of the waste in Dessel. Children can go and visit the centre with their schools or families.

The purpose was to make a workshop to go with the main expo that makes time clear for students of 10 till 12 years old. You can find all the results of the compilation of the information and research in this document.

To elaborate this workshop and to understand better the question, there was a research question formulated.

Which activities, in line with the Tabloo project, can stimulate in a concrete and active way the growth process of time perception with children aged 10 to 12 years by means of outdoor education, linked to the time it takes for radioactive waste, stored by the chemical company 'NIRAS', to become innocuous?

In this document the workshop is described. Firstly, you find a description of the elements that are in the workshop.

Then you can read the things that needed to be done before the workshop. Next you see the activities of the escape room. After you can read the activity that will be outside, the main game. Afterwards, the end of the game is described.

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1. Outdoor education in our activity

1.1 Phases of Cornell – ‘flow learning’

The **first phase** of Cornell is to **stimulate enthusiasm**. It's best to start an outdoor activity by making children enthusiastic. This enthusiasm is created by doing an escape room. In there will be natural materials. The puzzle that leads to the movie will be about natural materials. The riddles that the students can find will be connected to the natural materials by making the riddles on leaves and branches. The riddles itself will hopefully make the students enthusiastic as well.

At the end of the escape room, the children will see a video of a woman from the future. The woman tells them to go outside. She will be very mysterious, and the children will hopefully find it attractive. The students will get a coloured badge at the beginning. This will stimulate their enthusiasm to.

Phase two and phase three are often combined. In these phases there is a **focus on the different senses**. This is done throughout the whole activity. Some examples in the activity are:

- In the activities of 300 years, the children use their senses of sight, smell and touch.
- Throughout all the activities they need to search for boxes in the nature. They need to use their sense of sight all the time. This is also clear in the activity of 10 years where they need to search trees and search identity cards.
- There is one student who will make sure that all students enjoy the nature through the whole game.

In **phase 4**, you will **share your inspiration**. You're going to create a deeper consciousness.

The students will tell about their experiences, they share everything with each other.

They reflect together on what they have learned. This will be done by making stones about the future. The further reflection will be in the classroom with the teacher. There is a document for the teachers so they can easily reflect on the activity in the classroom.

1.2 Juliet Robertson¹

Juliet Robertson is an educational advisor from Scotland and supports schools to approve their outdoor education program.

She wrote about the **5 'R's**. She built this model to show how everyone can create the conditions to go outside everywhere.

Children need **routines**. Outdoors you can give them these. You need to make sure there is something the children can hold on to. There are made maps for the children that they need to follow, so every time they know exactly what they are doing.

There is also a board in the middle of the field to show children the order of the game and it organises everything a bit more.

To give a course outside, you also need **resources**. They are not always that hard to find. Children will have an easy access to the materials they need. There are boxes where they can find almost everything. They will use a lot of natural materials.

For the game ‘build a tower of 1 year’, the students will need to think about solutions. They have a lot of **natural materials** around them which they must use for solving the tasks.

¹ Professional learning International. (2018). *Outdoor learning: Maths in the early years – Juliet Robertson*. [Website]. Geraadpleegd op 4 maart 2020 via <https://www.professionallearninginternational.com/outdoor-maths-juliet-robertson/>

1.3 Mark Mieras²

Mark Mieras is a researcher who is fascinated by the **brain**. He investigates it to see what makes people who they are. He also wrote some core insights of outdoor learning.

Outdoor learning is valuable. Here are some reasons why. The reasons below are linked to the activity.

Children have a lack of movements. This also inhibits their cognitive development. **More exercise** at school helps. Pupils lose weight and get higher grades. Firm physical exertion stimulates the **production of growth factors** and improves attention. That's why they will be running in the activity for the whole game. They run from boxes to the rope and back. In the activities that they find in the boxes, they often need to be active to.

Self-regulation improves by moving and they behave better and more task-oriented in the classroom. It is especially about moving when playing agility games (for example hopscotch). These stimulate the **executive functions of the brain**. Some games include agility games. In the game of 100 years they need to hop 100 times on a field. They need to count at the same time. They will remember it better this way.

Language development and play are closely related, as are playful movements and spatial insight. Children who physically imagine actions are able to record them better. Children who make gestures in arithmetic and language also record the sums and words better. In the game, the students make their own family tree. While placing the wooden blocks, the students think about ages, days of birth, ... to make the tree complete. A second example of language development in the workshop is the activity of hopping 100 years. While playing this game, the students count while they jump. The activity of one year is a third clear example. While building the tower, the students learn the different holidays and characteristics of a specific month.

It works especially well when the pupils have already acquired knowledge in the classroom. **Knowledge** is the base and this allows the pupils to focus correctly. Groups will get information in the expo inside. This information can be used outside. It is not a problem if the students do the workshop before the exhibition inside because the most important information will be repeated and given.

The **environment** is also very important. A green schoolyard and a natural environment invites pupils to go outside and explore the environment. They really start to play exploratively and discover the outdoor. They show a great variety in playing behaviour. Thanks to the right environment, pupils will have considerably more focused attention and their working memory will work more steadily. At 'Tablo' there will be a very large yard. There will also be a little forest. It's a very green environment that invites children to play, to have fun and to enjoy.

Summarising there can be said that the important elements of these three people are the basecoat for our activity. The four phases of Cornell, the 'R's from Robertson and insights of Mieras are prior throughout the workshop.

² Mieras, M. (2015). Buitentijd = leertijd. *Op mieras.nl* [Website]. Geraadpleegd op 3 maart via <https://www.mieras.nl/schrijven/buitentijd-leertijd/>

2. Time in our activity

The perception of time of children is a phenomenon that develops by age. To lead the children through the awareness there are two big steps. The first step is that children learn terms to express time such as 'long', 'today', 'tomorrow', ... The second step is an important but also difficult one. The children make a mental transition from concepts of time to chronology. This step takes place between the ages of nine and eleven. It is important to focus on both aspects of the development of time awareness.

In the **escape room** the focus is on the **cyclical time**, time that repeats itself. Repeating different and important terms that the pupils already know is important. In the room the pupils fulfil tasks about seconds, minutes, hours, days, weeks and months. The children use **terms** in combination with **concrete materials** that make time visual (calendar, week planner, diary, ...) They **move around**, the materials in the room **motivate** the children, they **recognise objects from their own lives**, ... This last point of view is very important. About three quarters of the pupils in the pupils survey were able to estimate the duration of known situations. Therefore the escape room with the specific tasks was made.

In the outdoor part of the activity the pupils will experience the **linear time**. That is **visualised** by using a **timeline** classified with different **times**. The different times are now - in 1 year – in 10 years – in 50 years – in 100 years and in 300 years. Using this visualisation is important evidenced by the polls of time³. The children fulfil a task in every time period. In these **activities** the children experience the **duration of time**. For example, time is suggested by building a tower, making a family tree, counting year rings, seeing waste evolve, ...

To further investigate the perception of time, a questionnaire was made for pupils at 'weg-wijzer' with an age of 10 till 12 years. After the interpretation of the results, you can see that pupils **easily quote historical** time when they want to look back to the past. From the moment they start to estimate for themselves **how long something will stay**, they doubt.

So, you can see that both knowledge about the **historical time** and the **daily/personal time** can have more attention to develop in a better way.

To conclude, different stages of the development of time perception are combined in the workshop. There is a focus on using terms, there is a visualisation of the timeline and there are experimental activities to focus on duration. The purpose is to stimulate the time perception of children.

³ Verhaegen, A. (2011). *Peiling wereldoriëntatie: (tijd, ruimte, maatschappij en brongebruik) in het basisonderwijs*. [Brochure]. Brussel: Vlaamse overheid. Geraadpleegd op 5 maart 2020 via http://eindtermen.vlaanderen.be/peilingen/basisonderwijs/peilingen/peil_WO_web.pdf

3. Nuclear waste in our activity

The dates on the timeline were chosen to **emphasize nuclear waste**. The waste goes through a whole process over the years before it is no longer harmful and therefore no longer needs to be controlled.

With some of the time **milestones** next to the timeline, there will be little **'looking boxes'**. There the children can see how the radioactive waste is 'doing'. So, with 50 years they see that the place is done, with 100 years they see the robots going away, ... These principles also will be noted on the **instruction papers** for the children, so they certainly read it.

The following **anchor points** in the future will be included in the workshop (next to the timeline and in the fiches):

- Within **1** year: this will be used to build up the game gradually.
- Within **10** years: this will be used to build up the game gradually. This has also to do with the age of the children.
- Within **50** years: the project of the caissons will be finished here.
- Within **100** years: the inspection of the robots will be stopped. The robots normally drove around under the caissons to check for cracks....
- Within **300** years: from 300 years onwards, the waste will no longer be harmful to us.

The game board is also entirely dedicated to radioactivity and nuclear waste. The pupils are given one **bucket of coloured balls**⁴ for every group. These balls refer to the **radioactive radiation**. Each time they go to the next time period on the timeline, they can take **half of the balls** away. This makes it very concrete and visual for the pupils that **radioactivity decreases** if you go further in time. Here there is a link with the **half-life** of radioactivity.

To conclude, there can be said that different nuclear principles are integrated in the workshop. There is a clear link with the half-life of nuclear radiation and the building process of the storage buildings for nuclear waste. Visualization and the use of concrete materials are therefore crucial.

⁴ These balls will be put in little buckets for the try-out. These will have the form of a ball that has approximately a diameter of 10 centimetres. The balls will be of wood. Every group has their own colour. Every atom needs to have 32 balls. In total, 128 balls are needed.




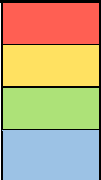

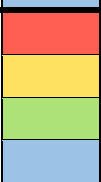



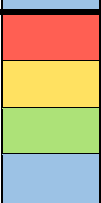

4. Before the activity

Teachers receive a booklet with information about the activity and their roll during the game. They also find references for outdoor education on which the activity was based. Goals and contents are explained. Finally, there are also ideas for lessons after the activity.

The pupils receive badges in the colour of their team. The badges describe their responsibility, which they will execute during the game.

For large classes, badges can be provided twice. If a small group is playing the game, the badges indicated with a '-' can be omitted. The badges marked with a '+' are essential in the game.

Teachers divide the students in groups of five (recommended) with the following badges according their talents. The teacher can also choose to give the choices to the students.

		+	If you have this responsibility, you can hold the map and lead the way.
		+	If you have this responsibility, you can take pictures of the challenges you and your group execute. Show them to your teacher so she/he knows what your group did.
		+	If you have this responsibility, you make sure that the group does not forget to go to the 'board' to put the atom further and to take half of the radioactive balls out.
		-	If you have this responsibility, you remind the group that they can look around and enjoy the nature.
		-	If you have this responsibility, you are the glue of the group. Has everybody the chance of doing something? You can make sure of it.
			

5. Start – escape room

The activity starts in an escape room. The whole class enters the room. They must try to get out together.

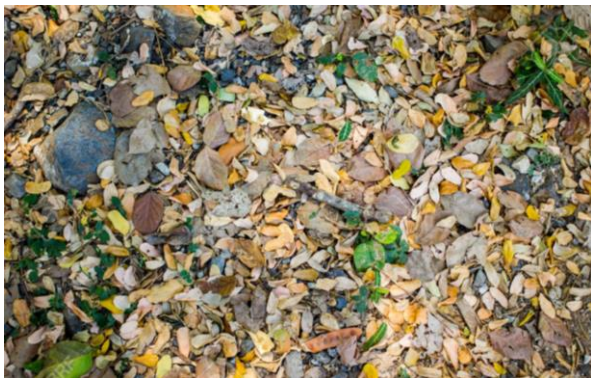
They receive the badge before they enter so they know in which team they are working.

In the escape room everything is dressed in natural materials. The assignments in the room will be related to seconds, minutes, hours, days, weeks and months.

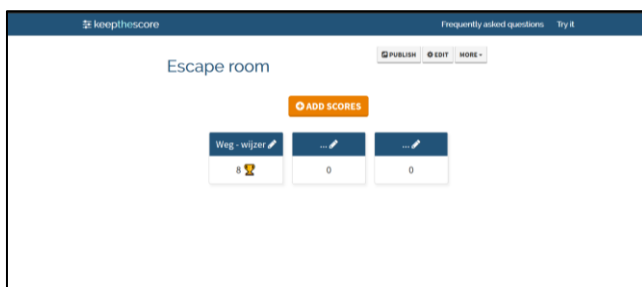
In order to carry out the assignments, the students will have to work together in their coloured groups.

Each assignment leads to a key which they can find on a large board full of keys in the centre of the room. These keys are used to open boxes with puzzle pieces. With the puzzle they can find the cards and the USB stick. On the USB stick is a video of a woman from the future. The woman explains the game for the outdoor activity.

They need all the pieces of the puzzle before they are allowed to leave the room.



When the students leave the room, they can write their time on a scoreboard.



S.n. (2020). *Keepthescore* [Website]. Geraadpleegd op 13 maart 2020 via

<https://keepthescore.co/board/prrywameke/>



5.1 Challenges

Red team & yellow team





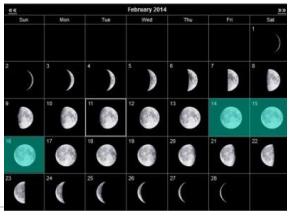





1. Poster

The students find pictures and a big poster with 1 minute, 1 hour, 1 day, 1 week and 1 month on it. The pictures need to come at the right place on the poster. If it is correct, they will find a code with the little numbers on the cards.

There are a lot of keys on a wall. Between the keys, they can find the keys with the next numbers:

Solution	
	Key: 5 4 3 2 7
	Key: 8 9 7 6 2



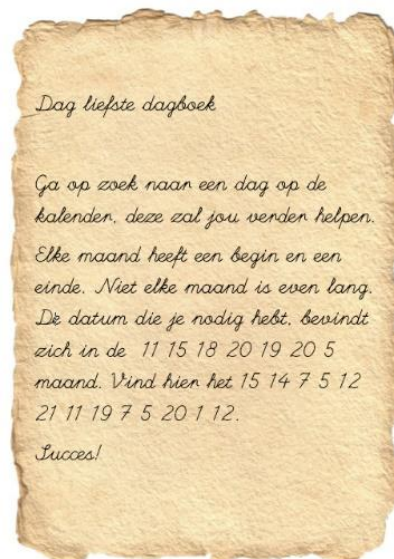
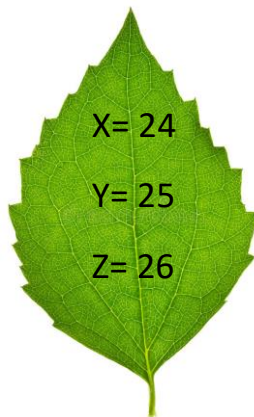
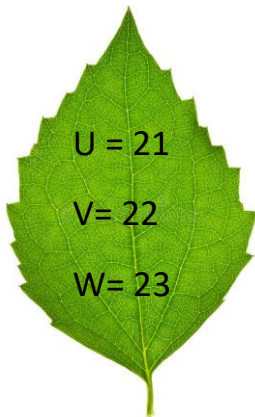
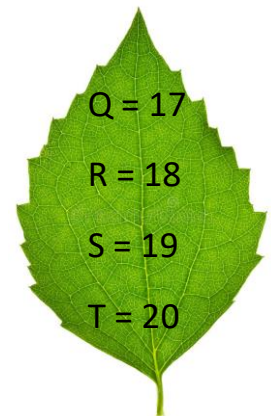
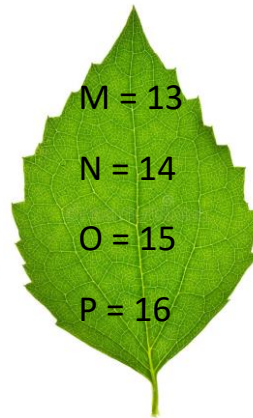
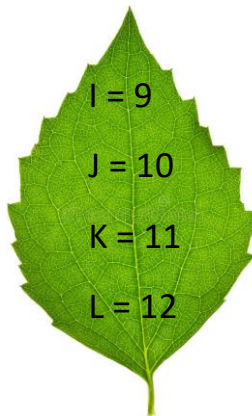
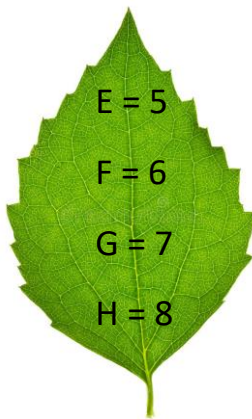
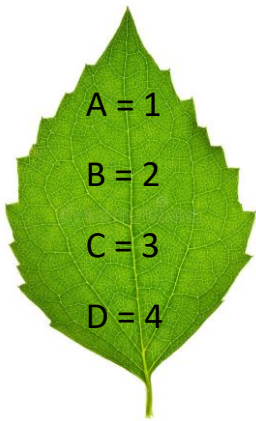
		
		
		
		

2. Mysterious diary

The students find a giant, mysterious diary on a desk in the room. In the diary they can find a message on the first page. This message is a riddle about a certain day of a month. Some words in the riddle are typed in code language. The descriptions are scattered all over the room.

The answer of the riddle leads the pupils to a monthly calendar and to a certain day on this calendar. Here they find the code of a key.

Solution	
	Key: 13
	Key: 31



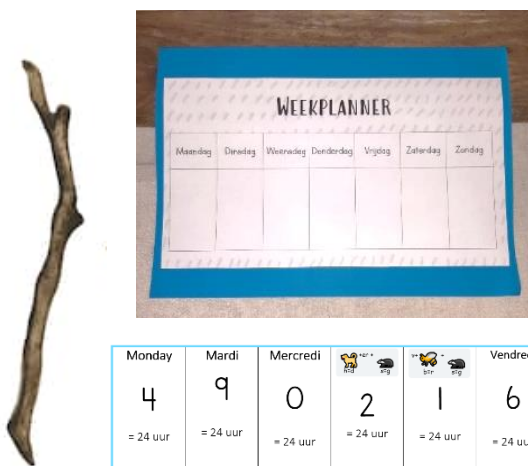
Blue team & red team

3. Calendar of the week

The students can find a calendar of the week on the wall in the escape room. On every day they can see a little piece of velcro.

In the room there are cards of the calendar hidden. They need to search the cards and need to put them on the right place on the calendar. The cards are hints that they need to decode first. At that way, they find a code and the key that goes with it.

Solution	
	Key: 4 9 0 2 1 6 7
	Key: 6 3 5 9 7 2 8



Lundi	Mardi	Mercredi	Jeudi	Friday	Dimanche
6	9	0	2	1	6
= 24 uur	= 24 uur	= 24 uur	= 24 uur	= 24 uur	= 24 uur

Yellow team & green team

4. Math

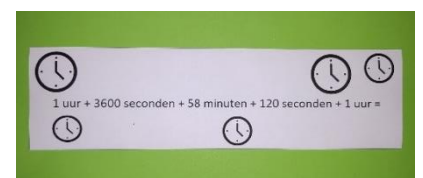
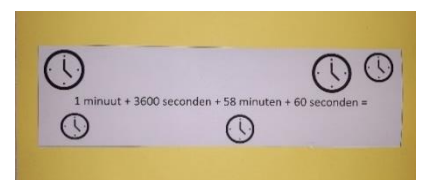
On the ceiling the students find a poster with a math problem. The students need to solve the problem to find the right clock that is hanging on the wall. On the clock they can find a number. That number leads to a key on the keywall.

Numbers on the clocks and keys:

Key 1: 98456	Key 3: 37594
Key 2: 89456	Key 4: 73593

(there are other words, but they are only on a clock and not on a key)

Solution		
	2 hour	Key 1: 98456
	4 hour	Key 3: 37594



6. Main game – outdoor search

The timeline outdoor is the main part of the outdoor activity. This is also where the teacher has the best overview during the game. It is advisable that the teacher stands next to the timeline.

The timeline will be situated on the area of NIRAS. Next to the timeline, there will be clear indications of time leading to the future. With some of the time milestones next to the timeline, there will be little 'looking boxes'. There the children can see how the radioactive waste is 'doing'. So with 50 years they see that the place is done, with 100 years they see the robots going away, ... These principles also will be noted on the instruction papers for the children so they certainly read it. On both sides of the timeline are coloured circles for each group. It works as a game board. Every group has their own bucket filled with balls.

The groups use their own coloured map to find their different boxes with tasks. The boxes are scattered on the terrain of 'Tabloo'. Each box has a colour corresponding to their group colour. When the students find a box and have completed the challenge, they take a picture and bring it to the teacher. After every task, the students return to the timeline. They show the picture to the teacher and may replace their bucket to the next stop.

The buckets contain coloured balls referring to radioactive radiation. When the students move their bucket to the next stop, they may take half of the balls out of the bucket. Removing the balls as you move forward in time, symbolizes the neutralization of a radioactive atom and therefore the reduction of radioactivity.

Each group has one person with a camera who photographs the outcome of the task. At the end of the workshop, the teacher receives the photos taken by the students during the workshop. The photos can be used in class to reflect on the workshop or to add to the website of the school.



6.1 Individual maps



Routes:


Red	1 year	Build a tower of a year
	10 years	Count the annual rings
	50 years	Going further or going back?
	100 years	Hopping 100 years
	300 years	Smelling the future
Yellow	1 year	Make a graph about your birthday
	10 years	Build your own timeline
	50 years	Make your own family tree
	100 years	Hundred field of art
	300 years	Looking to the future
Green	1 year	Build a tower of a year
	10 years	Count the annual rings
	50 years	Make your own family tree
	100 years	Hundred field of art
	300 years	Feeling the future
Blue	1 year	Make a graph about your birthday
	10 years	Build your own timeline
	50 years	Going further or going back?
	100 years	Hopping 100 years
	300 years	Looking to the future

The tasks in the boxes are about the time they said. All the exact tasks are in the fiches.

They need to follow their map to find all the boxes that will be hidden in the woods.



6.2 Boxes

1 YEAR – make a graph about your birthdays																			
Goal students	The students make a graph of their birthdays and think about the time by combining all the months together with a rope and cards.																		
Box	1 year																		
Groups																			
Materials in the box	<ul style="list-style-type: none"> - Two long ropes - Little stones with the months. (12) - Little stones with days. (31) - Little pieces of wood - Activity card (A5) - Red rope - White cards 																		
Activity	<p>The pupils look at photos of a step-by-step plan and make their own graph about their birthdays.</p> <p>In one year, they all have one birthday. There are twelve months and (28/29) 30 or 31 days. Can they make a graph of their birthdays?</p> <p>The pupils use the ropes to lay the axes of the chart. Then they place the days (vertical) and the months (horizontal) with the stones near the axes. The graph is now ready. Next, the pupils go to the month in which they have their birthday. In this way, the students form an actual graph of their birthdays.</p>  <p>Afterwards, the students lay a rock on their birthday and on a date in December.</p> <p>Next, the pupils take the red rope and connect the different stones to each other. Now they can leave the graph and have an overview.</p> <p>The following task is to lay the white cards on the red rope. They walk on the rope and while they are walking, they place the cards on the correct spot. The children will walk through the year and think about different milestones and dates in that year.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="3" style="text-align: center;">White cards</th> </tr> </thead> <tbody> <tr> <td>- Beginning of the year</td> <td>- Month 3</td> <td>- Month 8</td> </tr> <tr> <td>- Middle of the year</td> <td>- Month 4</td> <td>- Month 9</td> </tr> <tr> <td>- End of the year</td> <td>- Month 5</td> <td>- Month 10</td> </tr> <tr> <td>- Month 1</td> <td>- Month 6</td> <td>- Month 11</td> </tr> <tr> <td>- Month 2</td> <td>- Month 7</td> <td>- Month 12</td> </tr> </tbody> </table>	White cards			- Beginning of the year	- Month 3	- Month 8	- Middle of the year	- Month 4	- Month 9	- End of the year	- Month 5	- Month 10	- Month 1	- Month 6	- Month 11	- Month 2	- Month 7	- Month 12
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- Month 1	- Month 6	- Month 11																	
- Month 2	- Month 7	- Month 12																	

1 YEAR – build a tower of a year











Goal students	The pupils understand they need twelve months to make a year by building themselves a wooden tower and ordering the blocks according to their knowledge of the months.																										
Box	1 year																										
Groups																											
Materials in the box	<ul style="list-style-type: none"> - 12 wooden blocks with imperfections - Box with natural materials (leaves, branches, stones) to put between the blocks - Facts for the blocks about a year (also questions) - Activity card (A5) 																										
Activity	<p>The students see twelve blocks in front of them. With these blocks they must build a tower. This tower indicates one year. Sounds easy, but it's not. After all, the blocks are not formed the same. They must try to keep the tower straight by using natural materials. On the blocks are facts written about each month based on important dates that everyone knows. The pupils have to construct the tower month by month in the right order. On the instruction sheets for the students is written that the different descriptions refer to different months. It is very important to build the tower taking into account the ranking of the months.</p>																										
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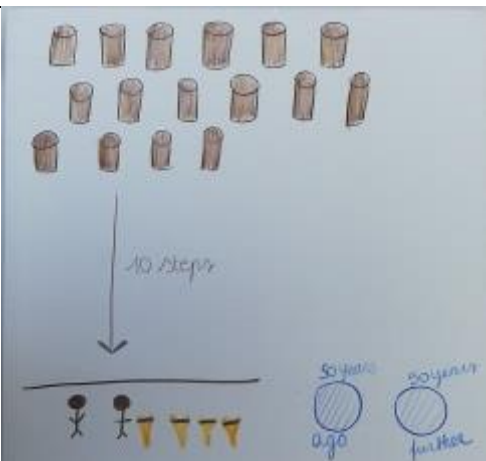
10 YEARS – build your own timeline.

Goal students	The pupils become aware of ten years by making their own timeline.	
Box	10 years	
Groups		
Materials in the box	<ul style="list-style-type: none"> - 5 x 25 wooden blocks with milestones, in different colours - 5 x 13 rocks with dates - 5 buckets 	
Activity	<p>Every student of the group draws a line of ten meter in the sand. Every big step they take, is approximately one meter. In this activity, the children will make their own timeline. Next to the box with the instruction of the activity, are five big buckets. The students will find wooden blocks and stones in the buckets. On the wooden blocks are different milestones written in different colours. The milestones are divided into four different colours. Red is for health, yellow is for relationships, blue is for school and green is for emotions. The stones contain different dates. The students start by placing the stones with dates on the timeline. Afterwards, the children take the milestones they already achieved in their lives and put them on the line taking into account the scale. Every meter is one year. When they are finished, they will have a representation of their lives of ten years. The students will think about the duration of ten year by comparing it to their own lives and milestones.</p>	
	Letters on the wooden blocks	
	<p>Red letters – Health</p> <ul style="list-style-type: none"> - First tooth fell out - Walk on my own for the first time - Ride the bike on my own - My brother/sister was born - I turned 10/11/12 years old - I was born - I became sick - A family member/friend became sick - I am cured - A family member/friend is cured 	<p>Blue letters – School</p> <ul style="list-style-type: none"> - Learned to write and read - First swim in deep water - First day in kindergarten - First day in primary school - Spoke my first words in French - Last school party (schoolfeest) - Went on a trip with school (bosklassen, zeeklassen...)
<p>Yellow letters – Relationships</p> <ul style="list-style-type: none"> - First real friendship - First time I fell in love - Parents got married - Parents divorced 	<p>Green letters – Emotions</p> <ul style="list-style-type: none"> - scared - sad - angry - happy 	
Dates written on the stones		
<ul style="list-style-type: none"> - 2008 - 2009 - 2010 - 2011 - 2012 	<ul style="list-style-type: none"> - 2013 - 2014 - 2015 - 2016 - 2017 	<ul style="list-style-type: none"> - 2018 - 2019 - 2020 - 2021 - 2022

10 YEARS – count the annual rings

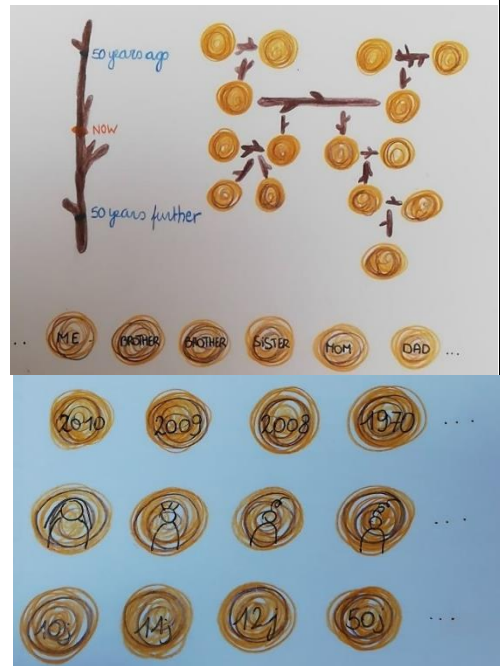
Goal students	The students feel what ten years is by comparing it with their own age. They compare it by counting annual rings and searching for trees.														
Box	10 years														
Groups															
Materials in the box	<ul style="list-style-type: none"> - Annual rings of 10, 11 and 12 years - Identity card linked on a tree - Activity card (A5) 														
Activity	<p>When the students arrive at the task, they see several pieces of wood on the ground. These all have annual rings. The pupils must find a wood stump of the same age. To do this, they look at the different annual rings.</p> <div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>OPTION 1 (When the trees at the Tabloo-site are ten, eleven and twelve years old.) The trees in the direct area of the task are given an identity card. On this card the pupils see what the tree would look like if you saw it in half. The pupils need to find a tree that has the same age by looking at the identity cards.</p> <p>OPTION 2 (When the trees at the Tabloo-site are older than ten, eleven and twelve years old.) The trees in the direct area of the task are given an identity card. On this card the pupils see what the tree would look like if you saw it in half. Then the students need to search for a tree with an identity card. They need to calculate how much older the tree is compared to their annual ring and so their age.</p> <p><i>Identity card of tree:</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="6" style="text-align: center; vertical-align: middle;"></td> <td style="text-align: right;">NAME:</td> <td>BERT TREE</td> </tr> <tr> <td style="text-align: right;">BIRTHDAY:</td> <td>23 FEBRUARY ...</td> </tr> <tr> <td style="text-align: right;">SORT:</td> <td>OAK</td> </tr> <tr> <td style="text-align: right;">MY LEAFS:</td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: right;">NATIONALITEIT:</td> <td>BELGIAN</td> </tr> <tr> <td style="text-align: right;">SIGNATURE:</td> <td style="text-align: center;"></td> </tr> </table> </div> <div style="flex: 0.5; text-align: center;">  </div> </div>			NAME:	BERT TREE	BIRTHDAY:	23 FEBRUARY ...	SORT:	OAK	MY LEAFS:		NATIONALITEIT:	BELGIAN	SIGNATURE:	
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50 YEARS – going further or going back?

Goal students	The students see and feel how long 50 years is by sorting pictures of 50 years ago and 50 years further from now. They need to earn the pictures first.			
Box	50 years			
Groups				
Materials in the box	<ul style="list-style-type: none"> - Activity card (A5) - Pictures what they think of the future (50 years from now) 			
	 flying cars (2070)	 Underwater highway (2070)	 New cities (2070)	 Experience space for classes (2070)
	 Holiday in space (2070)	 hoverboard-based sports (2070)	 Underground skyscraper (2070)	 Centre of stores (2070)
<ul style="list-style-type: none"> - Pictures past (50 years ago) 				
	 First 'jumbo jet' (1969)	 First moon landing (Apollo 11) (1969)	 Het last concert of the Beatles (1969)	 Fiji independent (1970)
<ul style="list-style-type: none"> - Pinecones and stones - Catapults - 16 empty cans (high ones) 				
Activity	The students need to place all the cans random at one place. In some cans will be pictures. They need to earn them by throwing canes away with pinecones and stones. They use a catapult. They stand on ten big steps away from the cans. When a can falls (or when they hit a can), they can take a picture out. They need to sort the pictures in 50 years ago and 50 years further.			

50 YEARS – make your own family tree



Goal students	The students feel how long 50 years is by going back in the past and going further in the future and looking at people in their family.
Box	50 years
Groups	
Materials in the box	<ul style="list-style-type: none"> - Wooden discs with icons of men and women (also a 'me', 'brother', 'sister', ...) - Activity card (A5) - Branches with lines with 50 years ago, now and 50 years further - Short branches (box full) - Wooden discs with dates of birth and ages
Activity	<p>The students all get discs with icons on them. With these, they can make a family tree of their own.</p> <p>There will be discs with 'brother', 'sister', 'me', 'dad', ... but also with random women and men. They have discs with people they already know, so they can make what they know first. The random people are for making it bigger and for example making things in the future.</p> <p>They need to think in the past but also in the future.</p> <p>Next to the tree there will be a big branch with 50 years ago– now – 50 years further on it. They are laying their already.</p> <p>Then there are little wooden discs with dates of births. They lay people now next to this line in a tree. They can put dates with them.</p> <p>The lines between the wooden circles have to be made of natural materials in the box will be lots of pieces of wood. They can use them.</p>




100 YEARS – 100 field of art	
Goal students	The students can create an artwork for things that happen in 100 years and they think about the duration of those things while creating.
Box	100 years
Groups	
Materials in the box	<ul style="list-style-type: none"> - Activity card (A5) - Field with 100 squares - Box with natural materials - Cards with things that can happen in 100 years
Activity	<p>The students read that in 100 years a lot can happen. They get a lot of cards with what can happen in 100 years. They need to choose three cards out of it.</p> <p>With those things that can happen in 100 years, they need to make an artwork.</p> <p>They get a lot of natural materials in a box and they can also use things they find.</p> <p>But the artwork needs to be on a field of 100 squares.</p> <p>Cards:</p> <ul style="list-style-type: none"> ➔ In 100 years there will have been 100 summer vacations ➔ In 100 years there will have been 100 times of summer ➔ In 100 years there will have been 100 times of winter ➔ In 100 years there will have been 100 times of spring ➔ In 100 years there will have been 100 times of autumn ➔ In 100 years nuclear waste will be under the ground without any controlling of robots ➔ In 100 years a person can be born and died ➔ In 100 years a turtle will be born and will still be here ➔ In 100 years nuclear waste can still be here ➔ In 100 years you will have celebrated your birthday 100 times



100 YEARS – hopping 100 times

Goal students	The students feel what 100 year is by hopping and counting every year through a game. That way they need to count to 100 in a special way.																																																																
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Groups																																																																	
Materials in the box	<ul style="list-style-type: none"> - Fiche (A5) - Field with 100 squares 	<ul style="list-style-type: none"> - Stones (2 colours, 2 teams) - Cards with hopping path (2 of each) 																																																															
Activity	<p>The students can find a field with 100 squares. They need to play a game on this field against each other. They need to hop 100 times. They start at one and go to 100. They play in two teams. Who can get first to 100 years?</p>  <p>Trough cards with numbers on, they know what their hopping path is. There are always two cards with each number. That way both groups drawn a different card. There are cards with dots and with stripes. (just as the stones) When a student pulls a card, he will get a hint trough where his partner needs to hop. Students start with card 1. Both groups place someone at number one of the field.</p> <p>When they hop, they count every year they hop. For example ‘1year, 2 years, 3 years, ..., 12 years’. Then they need to draw a new card. That will be card 2. The one that stands in the field can’t see the card because the other group members are reading it. At the end of the card will be a solution. That way the others can control the answer.</p>  <p>When a student is at his endpoint, he lays a stone to mark it. (different pattern for each team) The next student then starts there. That way every group member will be counting and hopping.</p> <p>This are the hopping paths they need to make with the cards that give the hints:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #d3d3d3;">Number</th> <th style="background-color: #d3d3d3;">Hint on the card</th> <th style="background-color: #d3d3d3;">Hopping path</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;">Card 1</td> <td>You are already that long on this planet. 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300 YEARS – looking in the future

Goal students	The students experience how unclear 300 years in the future becomes by using glasses to describe their surroundings to each other.													
Box	300 years													
Groups														
Materials in the box	<ul style="list-style-type: none"> - 2 times 5 = 10 different pairs of glasses (they get less clear) - 2 frames to look through - 2 blindfolds - Activity card (A5) 													
Activity	<p>In the box there are five glasses, the glasses are indicated with a year. Two students face each other, one student is getting blindfolded, the other puts on the first pair of glasses.</p> <p>The student with the glasses directs his frame to a piece of nature that he/she likes. The student describes very precisely what he/she sees.</p> <p>After the description it is up to the blindfolded pupil to find what the other described.</p>													
	<p>Then the groups change and put on the second pair of glasses. The students will discover that it is much more difficult to describe what they see with glasses that are connected to several years.</p> <p>The glasses become fainter and fainter as time progresses. There will also be a group of three students, they will make sure that the third student is also allowed to look or to get blindfolded.</p>													
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300 YEARS – smelling the future

Goal students	The students experience how unclear 300 years in the future becomes by using their sense of smell.														
Box	300 years														
Groups															
Materials in the box	<ul style="list-style-type: none"> - 4 jute bags with natural materials - 4 bags with clear strong and less strong smells - Green sheet with key - Cards with 'strong smell', 'less strong smell', 'faint smell', 'less faint smell'. - Activity card (A5) 														
Activity	<p>The students see in front of them four large jute bags. In the jute bags are different natural materials such as sand, branches, leaves...</p> <p>Hidden between the natural materials is a smelling box. It's up to the students to find the smelling boxes and take it out of the bags.</p> <p>The smelling boxes contain a different amount of dried lavender. The smell weakens every time you go further in the future.</p> <p>Next, the students place the white cards with the right bag. On the cards, the following words are written: strong smell, less strong smell, weaker smell, weakest smell.</p> <p>Amount of lavender:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Strong smell</th> <th style="width: 25%;">Less strong smell</th> <th style="width: 25%;">Weaker smell</th> <th style="width: 25%;">Weakest smell</th> </tr> </thead> <tbody> <tr> <td>Now</td> <td>In 10 years</td> <td>In 100 years</td> <td>In 300 years</td> </tr> <tr> <td>Full box of lavender</td> <td>¼ box of lavender</td> <td>1/8 of lavender</td> <td>1 or 2 branches of lavender</td> </tr> </tbody> </table>			Strong smell	Less strong smell	Weaker smell	Weakest smell	Now	In 10 years	In 100 years	In 300 years	Full box of lavender	¼ box of lavender	1/8 of lavender	1 or 2 branches of lavender
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300 YEARS – feeling the future

Goal students The students feel how long different wastes exist. They notice that some wastes stay for a very long time (300 years).

Box 300 years

- Groups**
- Materials in the box**
- 20 different feeling boxes
 - 3 cups
 - 2 thin plastic bags
 - 5 cotton earbuds of which 4 without lint
 - Lots of foam balls polystyrene (isomo) to mimic the nuclear waste
 - Photo of setup
 - Signs in different colours
 - Name cards with 'radioactive waste', 'cotton swab', 'plastic bag', 'plastic cup'.
 - Activity card (A5)



In this box the students find 20 different feeling boxes. The first assignment is to set up the boxes correctly, according to the picture.

After step one they feel row by row in the different boxes. They are not allowed to take the materials out of the boxes, but when everyone has felt, they can take a look in the boxes. Then the students put the name cards at the right rows. Finally, they place

the different '!'-signs next to the materials. This way the students think about the long period of time that waste can be harmful to humans and nature.

Content pots:

Plastic cup	Now	In 10 years	In 50 years	In 100 years	In 300 years
Plastic bag	Now	In 10 years	In 50 years	In 100 years	In 300 years
Earbud	Now	In 10 years	In 50 years	In 100 years	In 300 years
Nuclear waste	Now	In 10 years	In 50 years	In 100 years	In 300 years

Activity

White colour = cup is filled and after so much time the material is still there, there is less and less in the jars (e.g. with radioactive waste)

Signs:

	This waste stays dangerous for 300 years for nature, animal and human.		This waste stays dangerous for 100 years for nature, animal and human.
	This waste stays dangerous for 10 years for nature, animal and human.		This waste stays dangerous for 50 years for nature, animal and human.

7. End – reflection/ stones

The kids will all come together at the end of the 'timeline'. There they will briefly discuss about their experiences of the game.

Then they get the chance to think about the future.

What will last forever?

That is the question the kids get. They get to draw their answer on a stone. These stones will be put around the building of 'Tabloo' so they will literally lay there forever.



"Walk into the woods of time and see the radioactivity decrease."