

PEILI JA VAKOILUTUTKIMUKSIA

Mirroring for Minors co-operation between Denmark and Finland
Taipalsaari Kirkonkylä school pupils of Sanna and Kirsi
and pupils of Majken Sct. Mariæ Skole



We collected questions of
children with their parents.

There were interesting questions of mirrors.

Why there are mirrors at space? MIKSI AVARUUDESSA ON PEILEJÄ?

Why there are mirrors at cars? MIKSI AUTOSSA ON PEILEJÄ.

Daniel: "I think that they are necessary if you put make up

And you want to look at new clothes at car."

PYRY " IF CAR GOES BACKWARDS IT IS SAFE WHEN YOU LOOK AT
MIRROR."

We decided to have spy and mirrorproject at school of Taipalsaari

Kirkonkylä and ask if pupils of Majken at Sct. Mariæ Skole- Denmark

We made our diary with pictures at smart board

13.08 Glass of a door is like a mirror when it is dark outside and light on inside.

1.09 Walking with mirrors

10.9 The Magic carpet of Technology tales: Looking for reflections of ours of everyday items

3.9 Our lake Saimaa was like a mirror.

6-9.9 Task at home from where you are able to see your reflection.

9.9 Experiments with mirrors. Clouds at jar. Clouds hits a mirror.

10.9 Loosing a teeth- need of mirror

11.9 reflection upside down ,funny things with mirrors

15.9, telling a story with mirror

15.9 making a mirror of an egg with water inside the jar

22.9 Making stories with mirrors. The mirror was a bond...

23.9 Observations! Finding reflections while playing!

25.9 Be a mirror to your pair!

30.9 Looking for reflections inside the school and outside the school.

30.9 How to build an periscope.

1.10 Reflector-reflection is it the same thing?

5.10 Upside down glasses borrowed from Aarni

6.10, Art and spying at forest

13.10 Investigating eyes and colours of eyes

16.10 Funny reflections and building the periscope.

15.11 Sending ideas of mirroritasks of pupils between Denmark and Finland.

19.11 Making Escaperoom with ideas of pupils . Problemsolving with mirrors and periscopes

30.11 and 1.12 Video call to Denmark

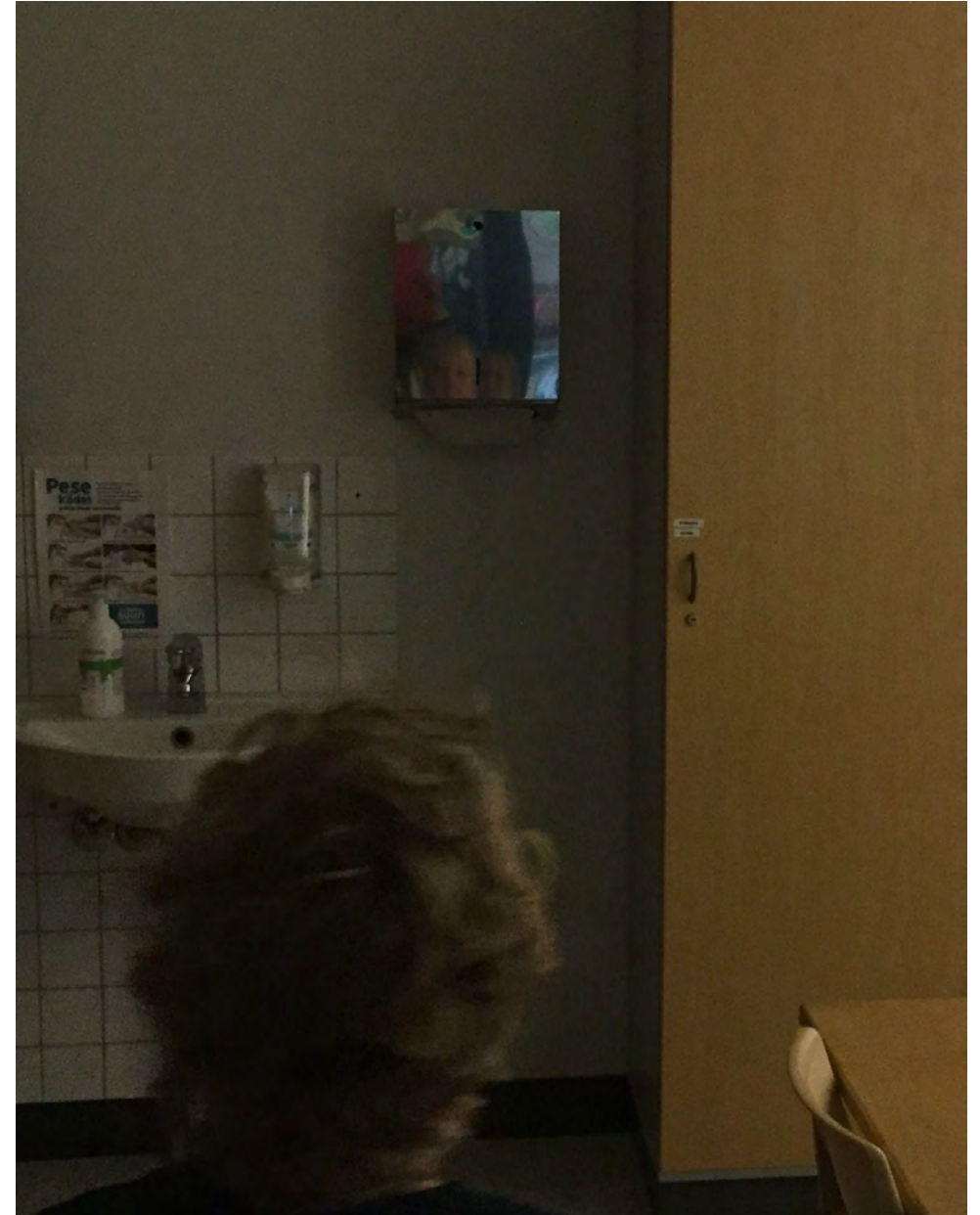
15.12 Escaperoom to 4 th class at Taipalsaari Kirkonkylä school- telling about our exploring of mirrors with escaperoom

January Spaceideas connect to mirrors and we ask questions from ESA- space-expert by email

LUMA –week 29.01.2021- 31.01.2021 Fairytale path with sciensce-storytelling and periscopes at Röytty area and QR-code stories



We walked at school and at schoolyard. We were looking for our reflections
Pupils of Majken did the same kind of task at Denmark.





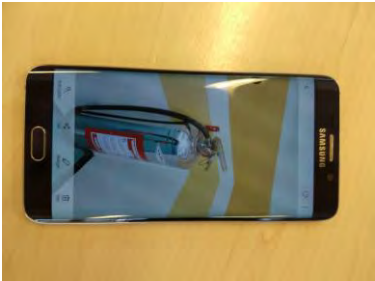


Solving tasks with pupils of Denmark with the pictures of Denmark.

- Group assignment: Sort the items after how useful they are as mirrors
- Storyline: Lilu and Alina are going to a party, but they have no real mirrors.
- Class assignment: Choose together 6 items from your findings Lilu and Alina could use as mirrors - perhaps you could also write a short story about how they find the items
- Working Together Apart: 3A sends pictures/drawings of the 6 items to the finish students and to their parallel class 3B. Will they sort them in the same order - and will they use the same arguments?**



A bicyckle helmet	A puddle	A blackboard (CleaverTouch)
Tiles	A bell	A fire extinguisher



Finland

A bicycle helmet	A puddle	A blackboard (CleaverTouch)
<p>6. best 40/45</p> <p>5. best 5/45</p> <p>you can not see the colour</p> <p>it is not "shining" like mirror</p>	<p>3. best thought 45/45</p>	<p>5. best 5/45</p> <p>6. best 40/45</p>
<p>Tiles</p> <p>4. best</p> <p>45/45</p> <p>they are square</p> <p>the look bright and reflective</p>	<p>A bell</p> <p>40/45 put this 1.</p> <p>5/45 put this 2. best</p> <p>thinks that this is the best to be used as mirror</p> <p>-it is metal, face can be seen, we look a little bit curved</p>	<p>A fire extinguisher</p> <p>5/45 put this 1.</p> <p>40/45 put this 2.</p> <p>the whole human can be seen</p> <p>here in Finland these are red</p>

Denmark

1	Puddle	<ul style="list-style-type: none"> · Good reproduction - the image is not distorted · It can be made with water from the water tap and you can make the puddle the size you want 	<ul style="list-style-type: none"> · It only works after it has been raining. When raining the surface is disturbed by water drops · The quality of the image depends on the material underneath the water and its color · The colors aren't clear 	3
2	Bell	<ul style="list-style-type: none"> · The colors are clear · It is made of metal · The face can be seen clearly 	<ul style="list-style-type: none"> · The image is distorted due to the spherical shape · Not everybody has a bell 	1

We read the answers of every item
With our pupils of Taipalsaari

Ensi viikolla:

Ma: 7-min sadulle

Ti: Metsäretki: Yhteistoimintaa; valmistamme "Äänimaailma"-taulun metsästä kuuluvista äänistä

Ke: Etsimme peilauspintoja sisältä ja ulkoa; "Mistä löydät peilikuvan?"

To: Vakoiluvälineen suunnittelua ja peilikuvatehtäviä piirtäen

Pe: Tutut perjantaiset pienryhmät (5/6) jatkavat tunne- ja vuorovaikutustaitojen, tutkimusten, satuhieronnan ja askartelujen parissa

Mukavaa viikonloppua kaikille!

t.Satakielen ja Kuhankeittäjän väki

Parents of children got letters and ideas of our project with mirrors. Parents and pupils were aware when we have our mirrorproject going on. Besides of that pupils used mirrors when playing the spies.

Peilaavia pintoja:

Rautakaide } pääovella
 Roskis }
 Ikkuna
 pylvään suojus
 vihreä aita
 liikutankki
 kennon ketjut
 oven kahvat
 pinkistä pyörästä
 pyöränsuojan tanko
 kiipeilytelineen metallit
 savupiippu
 tuuletin katossa
 keikkuvan penkin pulkki

MISSÄ PEILEJÄ TEHDÄÄN?
 VOISI MENNÄ KAUPPAAN JA KATSOA
 NIISTÄ PEILEISTÄ MISSÄ MAASSA
 NE ON TEHTY

LASI JA METALLI ON PEILEJÄ

29,5 x 29,5 cm
 0,2 cm

- oven lasi
- oven lukko
- vessan peili
- naulakko
- käytävän peili
- ruokalan kaappien lasiovet
- paperiteline
- portaiden metalliosat
- Sateenvarjon hankipöytä
- Sateenvarjon leikkimurin lasi
- ulkovalo
- roskapöytä
- metalli
- tolpat
- ikkuna
- kiipeilytelineen metalliosat

LASI
 IKKUNA

Every group told
 and took photo
 what they found,
 Adults wrote
 down the idea
 and thinking of
 children

VARASTON LUKKO
 SÄHKÖTULOPIPA
 OVEN KAHVA
 KIEPUTIN
 LAMPUSTULOPIPA
 AUTO
 KIIPULUTUNE

Lamppu
 Ränniputki
 Rautaputki
 Ikkuna
 Ovenkahva ja ovi
 Bussin keula
 Auton pinta ja peili
 postilaatikko
 Ilmalämpöpumppu
 metalliosat

Miksi peilejä on olemassa?

Peili
 Naulakko
 Kypärän
 vihreä ovi

KIRJAA
 KYSYKYSKSE

- Oven lukot, kahvat
- Ikkunat
- Sakset
- Tabletti
- Ruuvi
- Kello
- Piirtoheitin
- Mukij- ja paperiteline
- Metalliputket
- Ruuvit
- Loisteputki- valaisin
- Ruokalan linjat
- Siivouskärryt
- Muovilaatikko
- Metalliset tuolin jalat
- Puhelin
- Suihkun kahva
- Naulakot
- Saranat
- Peilit
- Portaiden listat
- Tikkaat
- Metallilätkä
- Lampun suojakuuvut
- Laukun solki
- Eteen valo
- hana
- Ramppi
- Sateenvarjon metalliosat
- teroitin
- kynäpurkit

LASI
 IKKUNA

METALLISTA NÄKYI KUVA
 OVEN KAHVA
 IKKUNASTA

LASISTA

VALKOISESTA PAPERISTA
 TONKI

VIHREÄ OVI

MUOVI LATTIA HEIJASTAA
 VALOA



Konsta: "We had an egg. It had to be black. We made it black with flame of candle."

Alisa: "We were going to make a mirror with jar of water and a black egg."







Kasperi: "When the black egg was in the water, we could see our reflection."

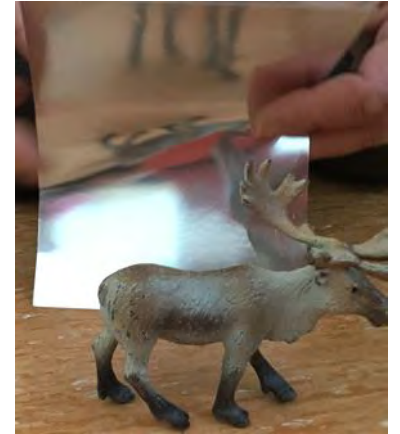






Essi: "Mirror is important when you are loosing a teeth"

Luukas: "We tested mirrors and reflections. It was funny when the reflection turned upsidedown."





Aarre: "We had a day of technology."
Eetu: "We borrowed
Materials from the Museum of Technology."
We also used the materials of school and items and
Spoons of Kirsi too."

Joonas: "We did grouping and investigated
which one can be used as mirrors."



Discussion and learning on the Magic Carpet.

While making observation moving, showing, touching, searching, finding, experimenting, arranging, photographing are important.

Every participant has the opportunity to get involved, think, tell and do grouping.





Eetu: "I can see my face at metal parts of items."





Nelli: "We were mirrors with our pair."

Kiira: "When I put a sticker to my face
My pair did the same way. It was funny.
But when I looked to the mirror
With my pair, we did not look
the same anymore.
I thought that I made it wrong. But the mirror
Changed our cheeks."





Lenni: "I made funny faces with Joonas."

Joonas: "I did not recognize ourselves when we looked at reflections and pictures of them."





Joonas : "Kindergarten of Cesis gave us an idea
To walk at nature with mirrors."

Alisa: "We must have a friend to take care while
We were looking at the sky."





Kasperi. "We were telling a story of weather with mirror

There were clouds and we draw with different liquids
Then we discussed how to make the mirror clean again.
Different liquids need different washing liquids.

Konsta: "With water the mirror was not clean. We needed
different washingliquids."

Alisa J. "We were telling a story of weather with mirror
We used different liquids- but how to get them away
from mirror? It was not easy!"

Lenni: "Make hypothese! Test! Solve out! That is what we did."





Susanna: We were playing with mirrors.”



Joona: " We were playing with flashlight and guessing where the reflect of the ligh will "go"

Kasper: " One was holding the flashlight, The others tried to guess where the reflection of light will go. They went to stand on that place." Essi: "We played long time!"

Making stories with mirrors. The mirror was a bond...



We found ideas worth experimenting
from the Lilu's house book

Promoting language skills in primary school through science

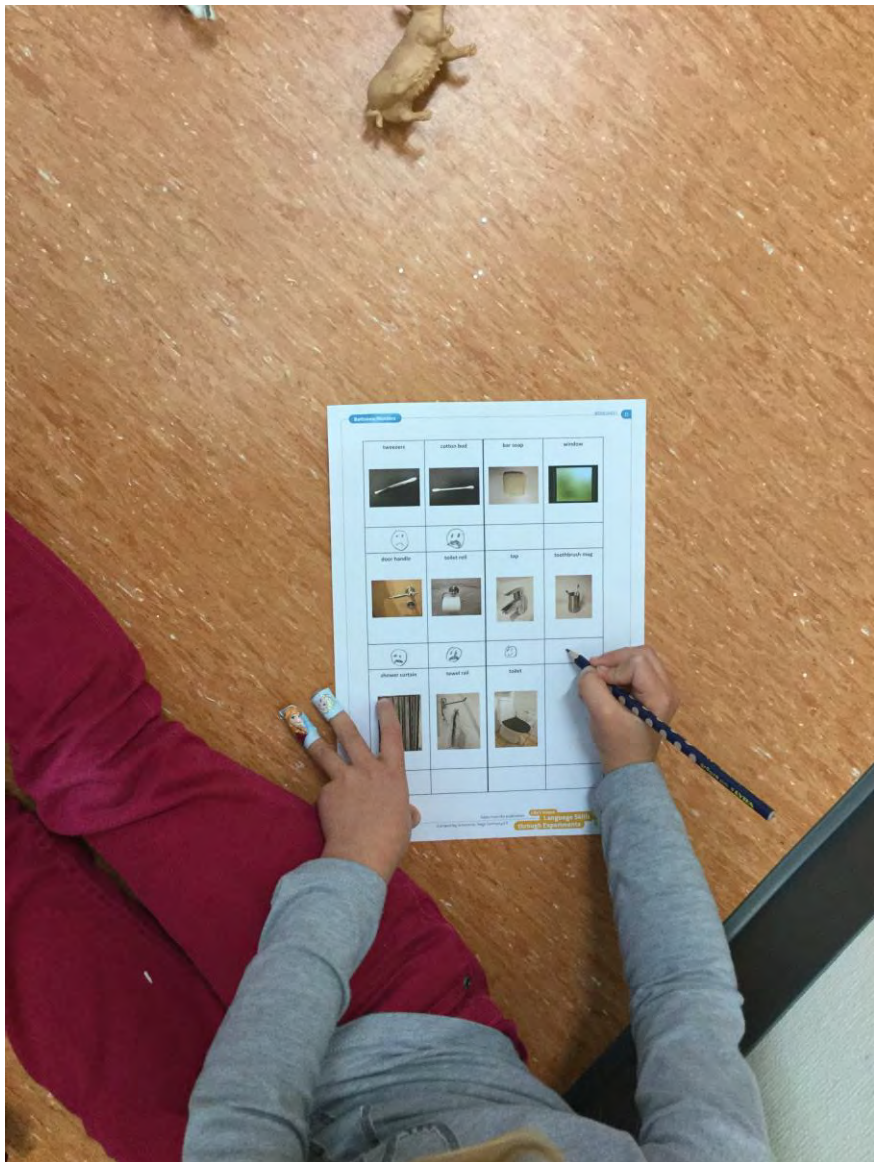
- ★ Increased need to tackle language difficulties among children in schools all over Europe
- ★ Demand for teaching resources relating to children's experiences from their everyday life
- ★ Language and science are key to knowledge and social participation
- ★ Close skills gap through systematic language promotion and basic scientific understanding already in primary school



#lilushouse

Start
collecting
words





Tasks of the book of Lilu`s house. What items can be used as mirror? Think! Tell your idea to your pair!



spies



Taking fingerprints with
mirror and flour

mistä löytyy kotona "peilejä"?

Emilia etsi, ~~to~~, tutki & löysi

- lusikka, mutta miksi kuvastus on siinä väärinpäin? \leftarrow kun näin lusikkaa katsoo
- kylpyhuoneen kahva sekä hana peilaavat
- ikkunasta voi peilata, kun valo heijastuu
- mikromovi
- musta telkkarin sekä puhelimen ruutu
- Takkaluokun lasista voi ~~pe~~ peilata
- Ld:n pinta



Moikka!

Viime viikolla Suskulla oli sisarusuintiin mennessä hypoteesi, että uima-altaan pinnasta voisi nähdä peilikuvansa. Oli vähän pettynyt, kun ei nähnytkaan, kun niin moni muksu oli uittanut varpaitaan aikuisten altaan reunalta ja vesi lainehti sen verran, että peilikuvaa ei näkynyt. Tänään veden pinta oli sen verran tasainen, että Susanna näki veden heijastavan ulkona olevan puun. Heijastavia pintoja on löytynyt kakkulapiosta ja iltahärmällä ikkunasta, sekä tietysti kaikki mahdolliset peilit autosta sekä kotoa. Valonkatkaisijaa tutki kovasti, että heijastaako se kuvan vai näkykö siinä vain hänen varjonsa.

Sinä vastasit tänään klo 16:10

Oi, kiitos! Ihana tutkija -Susanna 🍌 t Kirsi

Answers from homes/hometask.

Susanna found mirrors/ swimmingpool, window, cake tongue.

Emilia found mirros near the fireplace (glass), Tv,door of microwaveoven,

Window, faucet of bathroom, spoon (why the reflection is upsidedown?)



Colour of an eye could be solved and counted with mirrors.





Testing upsidedown glasses
Of Aarni





Flashlight and
reflectors,
catch the one
with relflector



Discussion, grouping at Magic Carpet of Technology tales.



Elmeri:
"We found out that we can
See our face from metal items.
Eetu: " I told my knowledge
of opisidion."





Walking with
mirrors.



Peilaavia pintoja:
Rautakaide } pölvellä
Roskis }
ikkuna
pylvään suojus
vihreä aita
liukutankko
Keinun ketjut
oven kahvat
pinkistä pyörästä
pyörimisjätun tanko
kipeilytelineen metallit
savupiippu
tuuletin katossa
keikkuvan penkin pultti

MISSÄ PEILEJÄ TEHDÄÄN ?
VOISI MENNÄ KAUPPAAN JA KATSOA
NIISTÄ PEILEISTÄ MISSÄ MAASSA
NE ON TEHTY
LASI JA METALLI ON PEILEJÄ
NIISTÄ VOI KATSOA OMAN KUVAN
TAI VAKOILLA TOISTEN TEKEMISTÄ



Questions: Who makes mirrors, how and where. Kasper: "We can walk to the shoppingcenter and read what is the name of land back of the mirror."
Luukas: " I have found out that metal and glass can be like mirrors. I can see my reflection." Konsta: "You can be spy with mirrors!"



Looking for items to make periscopes. Washing milk cartons.



Alisa A. : "We need 90 mirrors to make 45 periscopes.
and 90 milk cartons.

Pyry: " I m going to make the periscope of small boxes not the milk cartons."

Alisa A. "Ok then we need only 88 milk cartons."

Elmeri: " I found a periscope made by my
father, when he was a child long time ago.
That helped us to build a periscope of our
own. "



Making periscopes

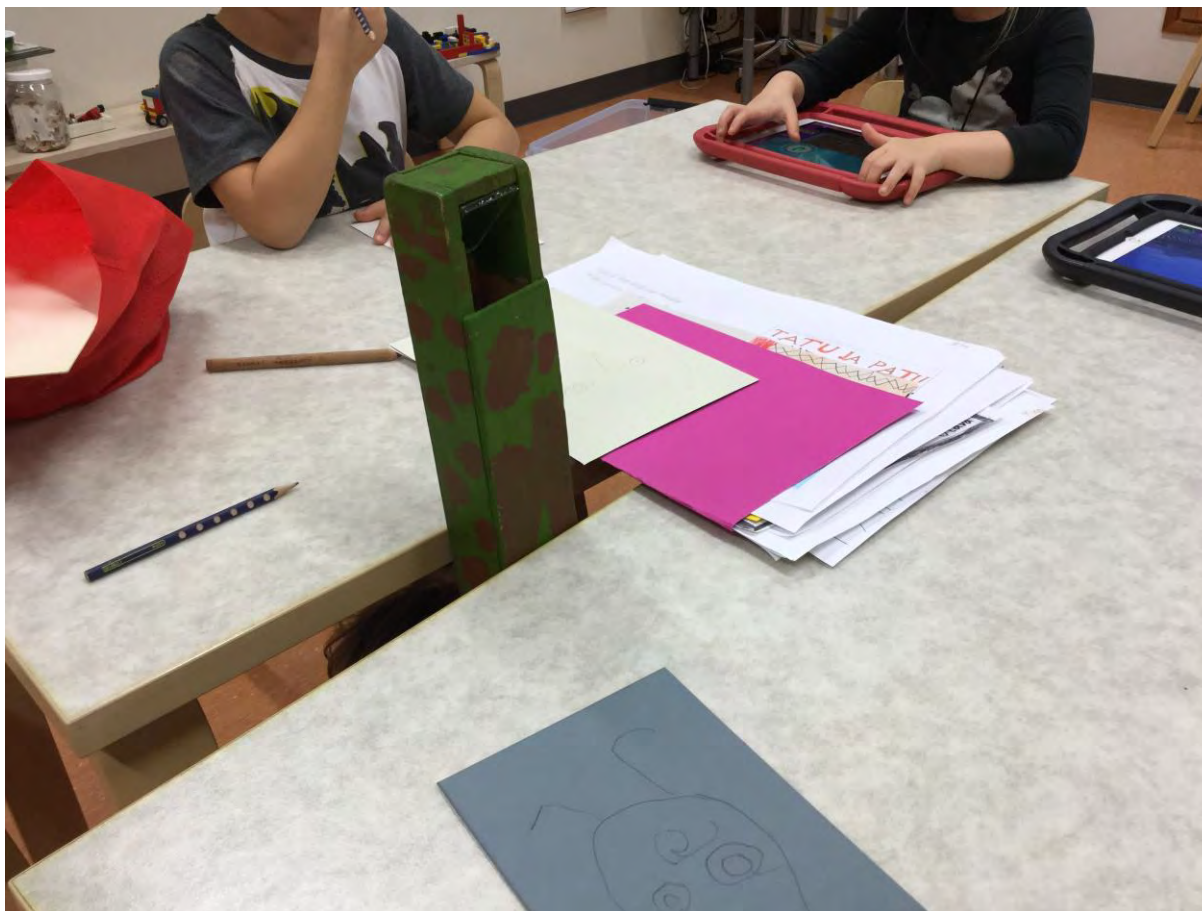


Spying

Eetu: "If we would
have taller periscope I could see from
Our class
who came in ." Kasper: "Lets make it."



Spies at work- Kiira: "We wanted to go to the english lesson and with our periscope we could be there."



Spy under the table and at forest.





We gave advices how to build a periscope.





Luma-Saimaa as a visitor
Taking fingerprints with hand cream, flour and mirror
And at last with tape from mirror.







If you want to be a superhero.
Just draw a superhero and attach that picture
To the mirror. Here is a superhero bear.



One of pupils: "I would like to have a kaleidoscope.

So lets make kaleidoscopes

Carton pipes,

Sequins,

Plastic circles

tape

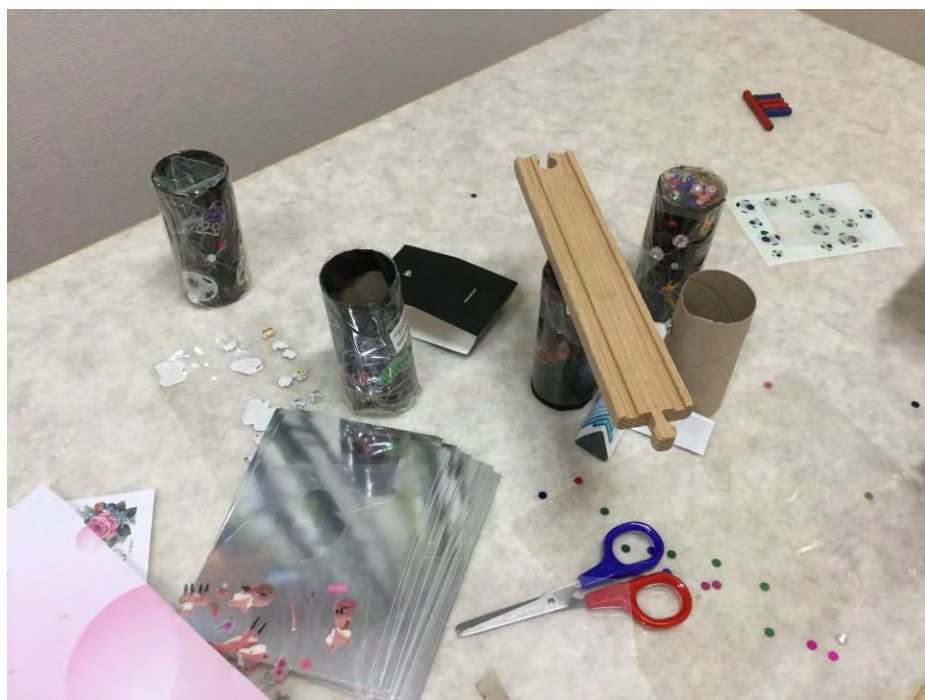
Reflective carton or paper.

Make a triangle: before placing your reflective paper inside the cylinder fold it in thirds to create a triangle

We tested our kaleidoscopes and discussed that the light coming in bounces off of the reflective paper.

Kasper: "I am able to see three reflecting images at same time.

Unna: "There are colorful shapes and sparkles."

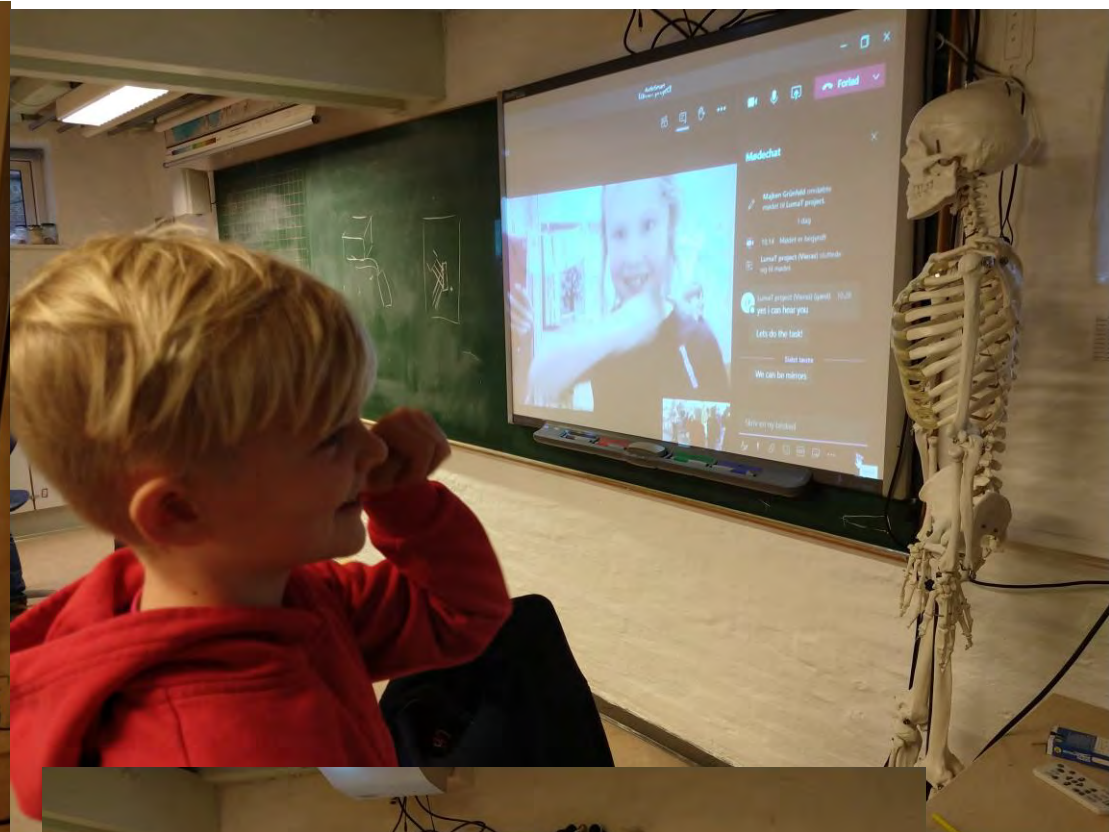




Alisa J: "We made kaleidoscopes."

Unna: "We needed carton pipes, glue, transparent plastic circles, Sequins, diamonds and reflective cardboard."





lines: "Pupils of Denmark could see our tall periscope.
We played mirrors. It was fun!"

Escape room task on Make yourself fly with mirror.



wing of butterfly- make it fly with mirror –

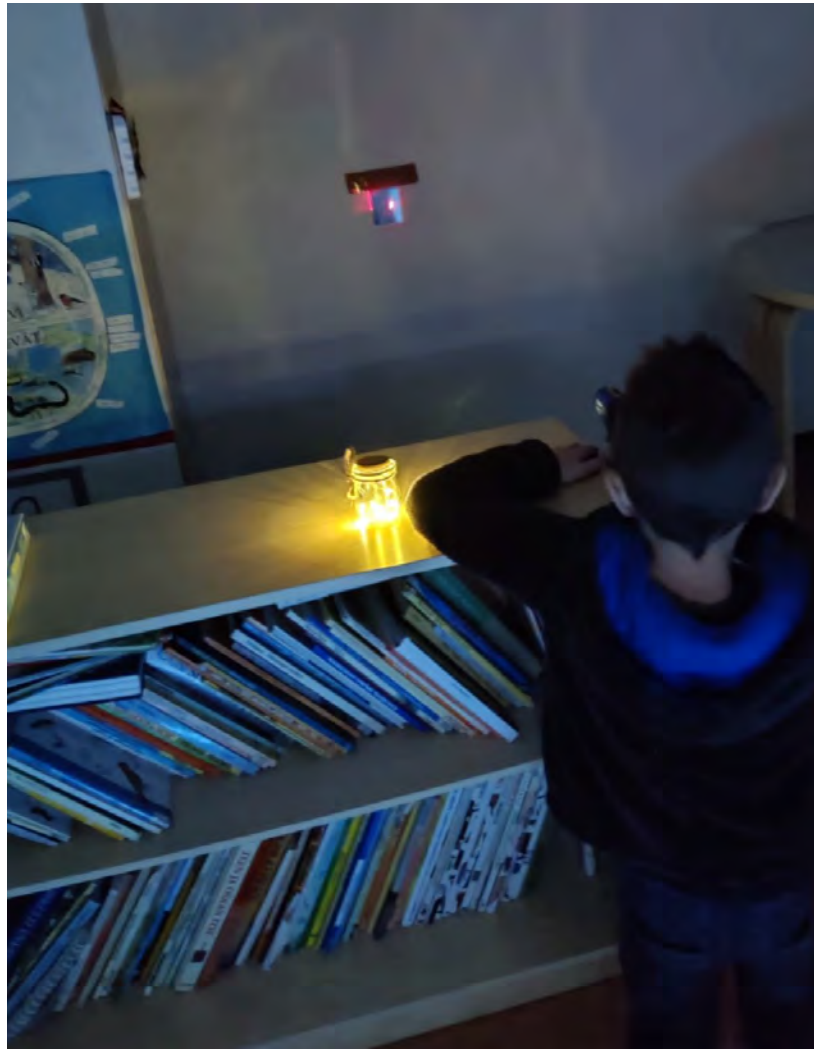
It is said that when butterfly is flapping the wings it may change the conditions and creat something new. (A Small change in initial conditions can creat significantly different outcome



Welcome to the room of secrets. Lets find out what kind of skills we will need in the future. Then task 3 go to the timemachine made with children. Put the flashlight on Try to find the hole of key. (mirror against the hole) .



Light- hole of key (the is a mirror) – the reflection goes to the floor- you will find an arrow



Escaperoom, Go to the room.

3. task 3 try to find the laser pointer. (Attached to the certain direction where is small mirror, put the laser on, , one of the pupils is holding the pointer and watching to the small mirror, everyone else is looking the opposite direction and they will give advices to the pupil holding the pointer so that the light on the opposite wall will go to inside the frames, when

the light goes to the frames you can read the text

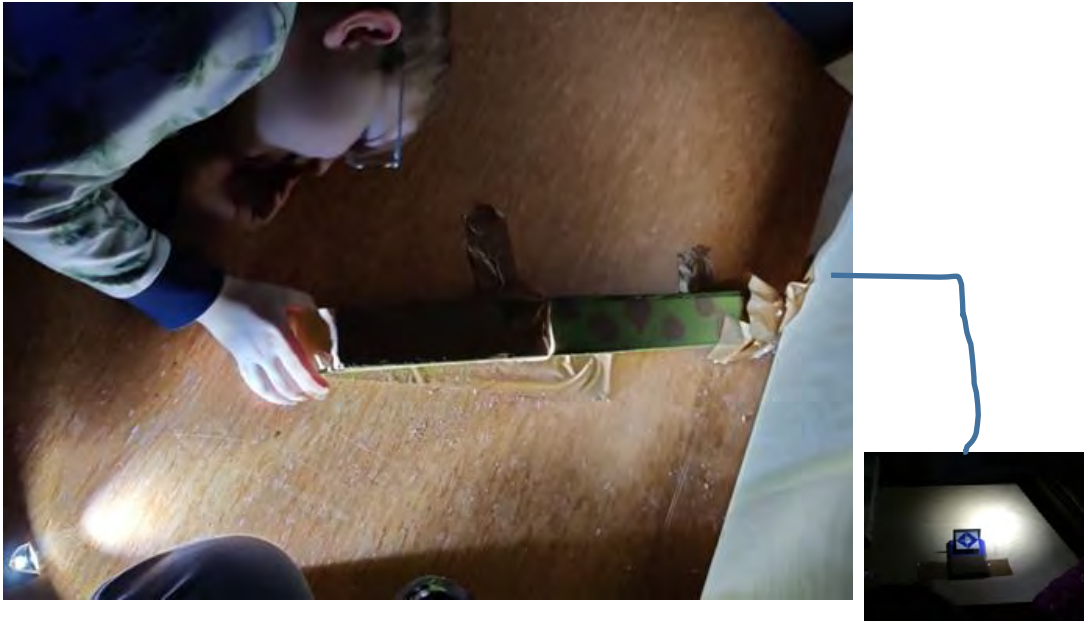


4. When red light of the laser pointer is inside the frames. You can read the text. Put the UV-light on! .



5. There is a text: Put the shining numbers in right order from smallest number to the biggest number. When to numbers are in right order turn the numbers around. There are now a text. that leads you to the periscope We got 0, 6 and 8 and the opposite of numbers was text PE -RIS -COPE

6. task Go and find a periscope and place it to the rectangle. Watch through the periscope, what do you see? (answer: rhombus)

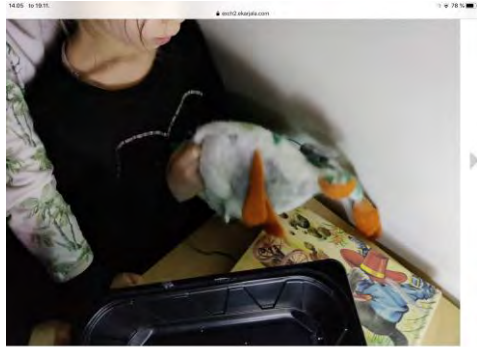


Actually we had to attach the periscope , otherwise the direction changed too much.
The pupils saw the shape (every one had a turn to watch-and they built same kind of shape using the cubes and the small mirror

You will see the shape. Buid the same shape!



Near the periscope was a lure (fishing equipment with mirror like surface). We got a fish with that.



Inside of the mouth of the fish was a key and we found marshmallows and text of future skills.

You will need **curiosity**- we discussed where they showed that and we discussed also about other futureskills

"The OECD Learning Compass 2030 distinguishes between three different types of skills (OECD, 2018[1]):

- cognitive and meta-cognitive skills, which include critical thinking, creative thinking, learning-to-learn and self-regulation

- social and emotional skills, which include empathy, self-efficacy, responsibility and collaboration

- practical and physical skills, which include using new information and communication technology devices"



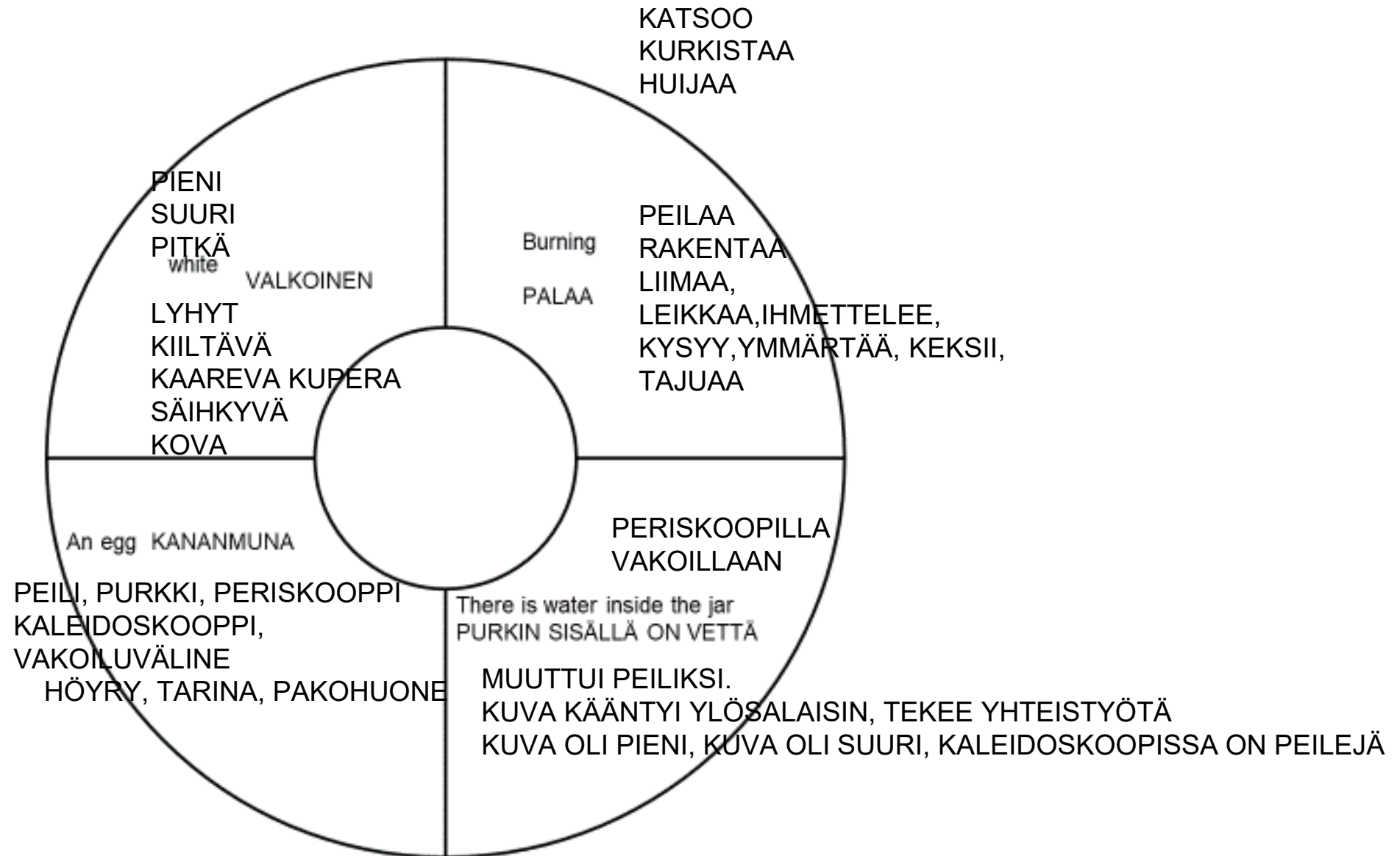
Escaperoom had a entrance made of boxes.

15.12.2020 will we build escaperoom to the school class of our school
While they are solving the mystery of escaperoom we are in a forest (because of covid)



VOCABULARY
EXPANDS

Start
collecting
words





Taipalsaari450
Fairytalepath
With LUMAstories at
Röytyy-area
Who is living inside?
Spies at work, the whole
Kirkonkylä school visited
the path.



We shared ideas between pupils Denmark and pupils of Finland

Lesson plan OF MAJKEN [DK] - Mirrors for Minors

3. Grade - 2x45 minutes per. Week

1.Week

Purpose: Students become aware of the properties of a mirror

-

Class discussion: What is a mirror?

- Group assignment: Find as many things as possible that could be used as a mirror. Take pictures and do drawings.

- Group assignment: Rank the items you found after their usefulness as mirrors.

2. Week

Purpose: Students develop both their communication skills and their social skills when they practice arguing for their assessment of an object's properties and at the same time must listen to the other students' assessments and arguments to reach a common agreement

-

Class assignment: Choose 6 of the reflective items you found last week. Discuss in class how useful the different items are and rank them in order of usefulness. Write down or record the arguments for choosing this order.

- If collaborating with another class: Compare with the order chosen by the students from the other class. Did they sort them in the same order - and did they use the same arguments? Discuss what the reason may be for the differences.

3. Week

Purpose: Students experience with their bodies how a plane mirror seems to be changing the right and left direction around while the up-down direction is maintained. The swap becomes very clear when the mirror-image-student suddenly must do things with the opposite hand of what the student is used to. In addition to being educational, playing mirrors can be used to promote the social learning community within the class or to build a social learning community with other classes.

•

Group assignment or classes meeting online: One student does an everyday movement the student would typically do in front of the mirror - like brushing the teeth, combing the hair, washing the face, or making grimaces. Another student pretends to be the mirror image.

•Class lecture: Reflection of light including the professional concepts incident ray, reflected ray, angle of incidence and angle of reflection.

4. Week

Purpose: Based on student conclusions the class formulates the law of reflection.

•

Class start-up: Refreshment of the professional concepts: incident ray, reflected ray, angle of incidence and angle of reflection.

•Group assignment: Place a light source and a mirror on a piece of paper. Draw the beam path from the light source to the mirror and away from the mirror. How does the angle of reflection depend on the angle of incidence? (Hint: Fold the paper where the light beam hid the mirror. The fold must be perpendicular to the mirror. Use a scissor to make a cut along the incident ray and try opening and closing the fold a couple of times. What do you notice?) Try out different angles of incidence - do you get the same result? If so, write down your conclusion and how you got to this.

•Class gathering: Based on the students' conclusion the class formulates the law of reflection and reflects on the number of times the same result must be achieved before drawing a conclusion.

5. Week

Purpose: Taking part in the concept development of an escape room the students must use both knowledge and creativity. Furthermore, this approach invites the students to take ownership of the teaching increasing their motivation.

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Class start-up: What is an escape room?

- Class discussion: What could be the focal point in the story of the escape room, and which tasks could be designed for the escape room.
- Individual assignment: Make drawings to support the story of the escape room and the tasks in it.
- Teacher challenge: Find the main thread in all the students' ideas and design an escape room that all the students will feel they have a share in.

6. - 9. Week

Purpose: The students experience how their contribution becomes part of a larger whole, which often both increases their self-esteem in the subject and makes them want to learn more. Furthermore the students develop their problem solving skills when doing the escape room tasks.

•

Group challenge: Who will release the heritage of Mirroria?

- Class evaluation: What can be done to make the escape room even better?

Lesson plan of Kirsi [FI] - Mirrors for Minors

0. Grade

Before the project we got many questions of children. Part of the questions was collected by their parents, part of the questions we got at school.

Lesson planning before the project, grouping the questions:

- We gather in a circle and the teacher starts to read the questions. (our pupils are age of six and they are not able to read yet)
- We have baskets of different colors. Green basket gets questions of nature, Silver basket gets questions of mirrors, and so on.
- Teacher reads the questions and together we think where it belongs.
- This year we noticed that we got mostly questions of mirrors.
- We continue the discussion. How we can learn something about mirrors, how to investigate and explore?
- Pupils make suggestions. We write all the ideas on the wall. One idea was that we go and find where the mirrors are hiding!

Some of our lessonplans of Finland, but we did much more

Lesson 1.

- You will need iPads/cameras.
- Teacher gives advice. We will have project of mirrors. Say 1,2,3,4,5, 1,2,3,4,5 let's make groups .
- Pupils listen advice. " Go and look around inside and outside of our school., try to find surfaces you can use as mirror. Work at small group, take photos of mirror like things you can use as mirrors.
- Groups 1 and 2 start outside and groups 4,5 and 6 start inside. Everyone has their own turn to take photos. After 20 minutes we change places. 4,5 and 6 come inside and 1 and 2 go out.
- At the end, pupils gather and tell what kind of items could be used as mirrors.
- While pupils are telling what they found we start our diary. Soon diary will also have with pictures taken by pupils. We look pictures of their own. We try to make thinking of pupils visible.
- Pupils know that we will have tasks with mirrors on Tuesday and on Friday and also tasks at home.
- Home task: look around at home: from where you are able to see your reflection. Take a picture, send it to the school and discuss at school.
- Discussion at class, grouping the pictures that pupils think to belong together. What kind of materials can be used as mirrors?

Lesson 2

- We gather in a circle at forest. Pupils listen, we are going to have experiments. When the bell rings we will change the task.
- 3.1. Walking with mirrors with pair. The other one has the mirror against the sky below his eyes the other one walks and leads the pair safely and listens the description of what the pair is able to see. They change the places.
- 3. 2. Clouds at jar. Clouds hits a mirror. What happens when instead of cover of jar we use the mirror.
Items needed: jars made of glass, cover to the jar, mirror, icecubes, hot water, hairspray
- 3.3. Playing spy with mirrors
- When pupils hear the bell, they will change the places. Teacher is always taking care of safety. (hot water) Our group has assistants, so we have an adult at every group.
- Bell rings. Last thing at forest is that they have 20 minutes free time to play at forest.
- We walk back to school.

Lesson 4

- The Magic carpet of Technology tales: Looking for mirror like surfaces of everyday items and making museum of our own. Now the items were collected from school. (Pupils can bring items of their own when the situation is not like covid-19)
- Pupils are seated around the magic carpet of technology tales.
- The children's own Museum of Technology will be set up on the Magic Carpet using different objects. This activity pulls together themes that the children have learnt about during the project.
- Introducing the objects
- All objects are placed in the middle of the carpet for everyone to see. Part of them can be used as mirror, some of them does not.
- Everyone has they own turn to take an item and introduces it to the others.
- What is it? Who do you think does it belong to? Is it old?
- Can that be used as mirror? What is the material of that item?
- Dividing the objects into groups. What kind of objects could be connected to each other and why? What kind of items can be used as mirrors, are they soft, hard? big? small? Describe the items!
- Placing the exhibits in the space T
- Name and story. What could be the name of the exhibition?

Lesson 5

- Experiments with mirrors outside at forest
- Three different tasks. Do the task and change the group, when you hear the bell.
- 5.1 making a mirror of an egg with water inside the jar
 - You will need candle, matches, transparent jar, water and an egg, for example salad servers made of metal to keep an egg near the flames.
 - One of the pupils makes a videorecording, one takes photos, all other observe.
 - Procedure:
 - Light the tea light.
 - Place the egg over the flame.
 - Keep the egg in the flame until the whole head is black.
 - Put the egg into the water.
 - Look at the egg from different angles - what do you see?
- 5.2 Be a mirror to your pair! Otherone is mirror the other one is human. The pair will change the places.
- 5.3 Pupils have noticed that they can be spies with mirrors. Try to find out what the other two groups ar doing while using the mirror.
- Bell rings – change the group!

- **Lesson 6.**
- Reflector-reflection is it the same thing? Mirrors and reflectors inside the dark gym
- Teacher places small mirrors to the walls of gym and attach reflectors to the sleeves of robbers/pupils. Polices have flashlights and they try to catch the robbers.
- Discussion after the "playing and running- robbers and police" What is difference between reflector and mirror? What if people had mirrors hanging and the car with lights comes nearer the people? Who wears reflectors while working? Firemen, policemen..

Lesson 7

- Pupils noticed that they are able to be a spy with mirrors. So, how to build a periscope and be a better spy
- 6.1 how to cut the mirrors (cutting made by Kirsi) we got permission to borrow the glass cutter, but what does it look like? We had problem solving while looking for the cutter.
- 6.2 What do we need to build a periscope? Pupils will solve the task. Pupils draw a model of periscope. One of our pupils has a periscope at home.
 - Visit to the kitchen to get milk cartons, pupils may use other items too.
 - Collect the items. We made periscopes at small groups. And the first group taught the way to do it to the next group.

Lesson (

- Sending ideas of mirror tasks of pupils between Denmark and Finland.
- Pupils of Denmark were looking for reflections inside the school and outside the school. We got all the pictures and solve out what we think is best to be used as mirror. This task is first when we go to our escape room.

Lesson 9

- Making Escape Room with ideas of pupils. Problem Solving with mirrors and periscopes. Pupils suggest what kind of tasks we could have.
- Pupils make time machine of big cardboardboxes. We visit the escape room with small group of pupils. Sharing ideas with teacher Majken and pupils of Denmark. → CONTINUES

-

Tasks to Escape room of Time Machine

1. Make yourself to fly with mirror

2.

Wing of butterfly- make it fly with mirror –

It is said that when butterfly is flapping the wings it may change the conditions and create something new.
(A Small change in initial conditions can create significantly different outcome.)

Welcome to the room of secrets. Let's find out what kind of skills we will need in the future.

3.

Then task 3 go to the time machine made with children. Put the flashlight on. Try to find the hole of key. (mirror against the hole) .

Light- hole of key (there is a mirror) – the reflection goes to the floor- you will find an arrow
Go to the room.

Next try to find the laser pointer. (Attached to the certain direction where is small mirror, put the laser on, one of the pupils is holding the pointer and watching to the small mirror, everyone else is looking the opposite direction and they will give advice to the pupil holding the pointer so that the light on the opposite wall will go to inside the frames, when the light goes to the frames you can read the text)

1. When red light of the laser pointer is inside the frames of opposite wall. You can read the text. Put the UV-light on! .

2.

There is a text: Put the shining numbers in right order from smallest number to the biggest number. When the numbers are in right order turn the numbers around. There are now a text. that leads you to the periscope We got 0, 6 and 8 and the other side of numbers was text PE -RIS -COPE

1.Go and find a periscope and place it to the rectangle. Watch through the periscope, what do you see? (answer: rhombus)

Actually we had to attach the periscope , otherwise the direction changed too much. The pupils saw the shape (every one had a turn to watch-and they built same kind of shape using the cubes and the small mirror
Make same kind of shape-

Near the periscope was a lure (fishing equipment with mirror like surface. We got a toy fish with that.

Inside of the mouth of the fish was a key and we found marshmallows and text of future skills.

You will need curiosity, problem solving-skills- discussing

Lesson 10

- Make Video call to Denmark, Be a mirror to your pair Denmark- Finland
- Working Together Apart: 3A+3B sends their order to the finish students and to their parallel class.
- Beside this pupil of Denmark want to invite the finish students to be their Teams-mirrors when they do everyday movements they would typically do in front of the mirror - like brushing their teeth, combing their hair, washing their face and making grimaces.
- People sit ready for a call. Everyone has their own turn to be a mirror and be a human.
- We discuss that pupil at Denmark have same kind of project as us.
- We will show our tall periscope to pupils of Majken in Denmark.

Lesson 11

- Pupils make Movie to show the idea. Make a movie with iPad trailer. (Idea from pupils.)
- Pupils of Finland will build an escape room to the pupils age of 9 to 10.
- Escape room to school class made by pupils of mirror project, visitors of escape room are going to be from class 4.
- Discuss: What was best when we had escape room of our own?
- Items of last escape room available to see.
- We place them to the room together.
- Pupils make small cards to say the solvers of escape room-well done!

Lesson 12

- Pupils came from class 4 to visit the escape room of Mirror project-pupils.
- Kirsi waits the pupils of class 4 with mask- pupils of Kirsi are at forest.
- because of covid-19 we cannot be near other classes.

Mirrors for Minors

Diary from Denmark

3/11-20 [email]

Kirsi asks if I will do a project with her. I need to know something more, so we agree to meet at skype in the evening.

3/11-20 [skype]

Kirsi and her class wishes to participate in the StarT competition and asks if me and my students will join the competition with them.

Kirsi tells about the competition and her thoughts for a project. Kirsi already has a lot of ideas and during our talk these ideas further develop, and we also come up with new ideas together.

Because we do not teach the same grade and because we are from different countries, we of course have two different curriculums to comply with. The scientific method is however the same and the educational goals in both Denmark and Finland includes the development of problem solving- and social skills. We therefore agree to plan activities to promote the development of these skills with room for us both to do what else is necessary for us to reach our national educational goals.

We agree that looking for objects that has some of the same properties as a mirror would be a good starting point, that building periscopes somehow must be incorporated in the project and that we will not go for doing the same but will go for getting inspired by each other's teaching.

I love developing teaching ideas and trying them out, so there is no doubt in my mind, that I wish to take part in a joint project, but I need an approval from my leader.

3/11-20 [LinkedIn]

I suggest "Mirrors for Minors" as a working title.

4/11-20 [email]

Kirsi sends me the details of the competition for me to pass on to me leader.

4/11-20 [email]

I'm mailing Kirsi telling her that my leader gave his approval but advised me to get the parents accept as well. Kirsi had earlier talked about writing a project diary and I suggest that we in the diary incorporate reflections about how we will work with our curriculum in the project.

9/11-20 [email]

Kirsi sends a movie of her students looking for mirrors outside school.

9/11-20 [email]

I inform Kirsi that I will start working with mirror next week and that I have not got all parents signature yet.

9/11-20 [email]

Kirsi writes a mail telling me about the Finish curriculum including an overview of the National Goals for Basic Education and Transversal Competences, which goes well with the Danish Goals of teaching. Besides this she writes that her students right now are making periscopes, and that her students have suggested making an escape room.

10/11-20 [email]

I'm letting Kirsi know, I have registered for the competition.

12/11-20 [shared document]

I create a shared document that can be used as a diary and as a place where we can collect all our ideas.

12/11-20 [shared document]

I add my lesson plan and ask Kirsi's students to rank some of the reflecting object my students found at school:

- Class discussion: What is a mirror?
- Group assignment: Find as many things as possible that could be used as a mirror. Take pictures and do drawings.
- Group assignment: Sort the items after how useful they are as mirrors.
- Storyline: Lilu and Alina are going to a party, but they have no real mirrors.
- Class assignment: Choose together 6 items from your findings Lilu and Alina could use as mirrors - perhaps you could also write a short story about how they find the items. Discuss in class how useful the different items are and arrange them in order of usefulness. Write down or record the arguments for choosing this order.
- Working Together Apart: 3A sends pictures/drawings of the 6 items to the finish students. Will they sort them in the same order - and will they use the same arguments? That will be very interesting to find out.*

6/11-20 [shared document]

Kirsi writes that she and her students look forward to receiving the pictures from Denmark. Meanwhile they are working on planning an escape room. She writes:

•

Welcome to the room of secrets. Let us find out what kind of skills we will need in the future.

- First task- wing of butterfly- make it fly with mirror.

It is said that when butterfly is flapping the wings it may change the conditions and create something new. (A Small change in initial conditions can create a significantly different outcome.)

- Task 2 Fly with big mirror

Afterwards go with the time machine made with children. Try to find the hole of key. (mirror against the hole) Put the flashlight on. Go to the room.

- Task 3 try to find the laser pointer. (Attached to the certain direction where is small mirror, put the laser on, where does the light go)

- Task 4 Light went to point the white paper. There is a text: Put the numbers in right order. 9, 10, 5, 3, 7, .. When to numbers are in right order turn the numbers around. There is now a text. that leads you to the periscope.

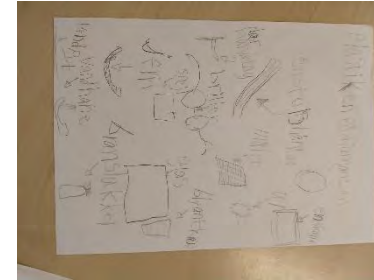
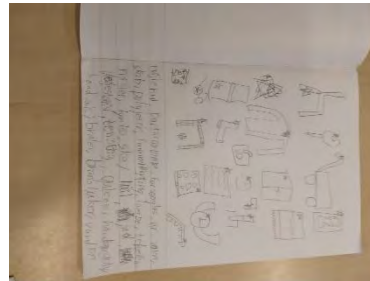
- Task 5 Go and find a periscope and place it to the rectangle. Watch through the periscope, what do you see? Make same kind of shape of everyone in the group.

- What kind of problem solving would you create?

- Escape room where you can survive with mirrors.

16/11-20 [shared document]

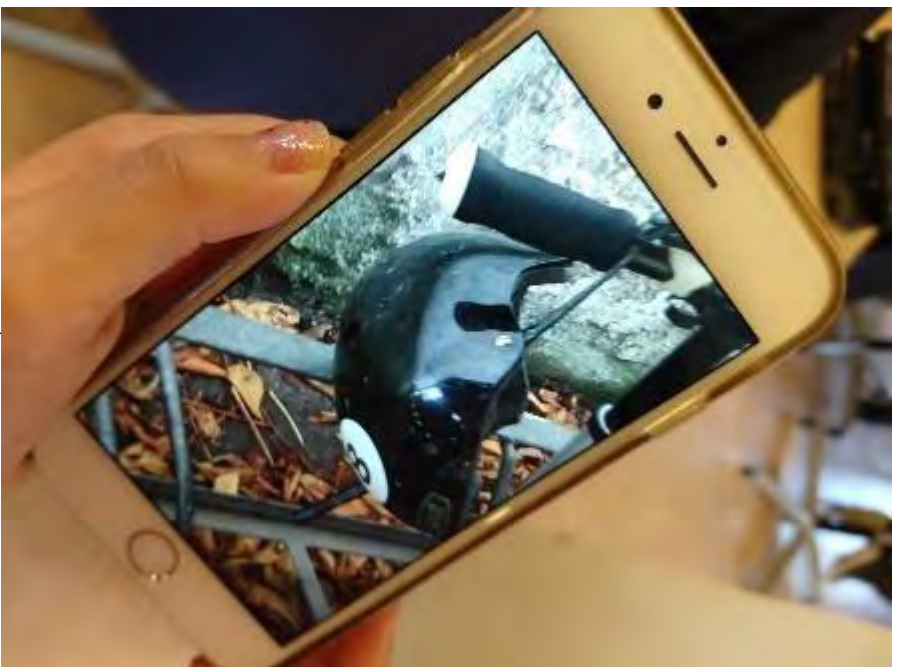
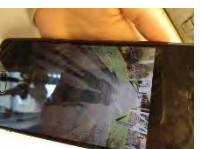
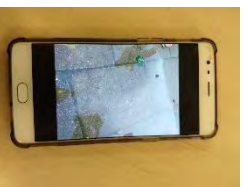
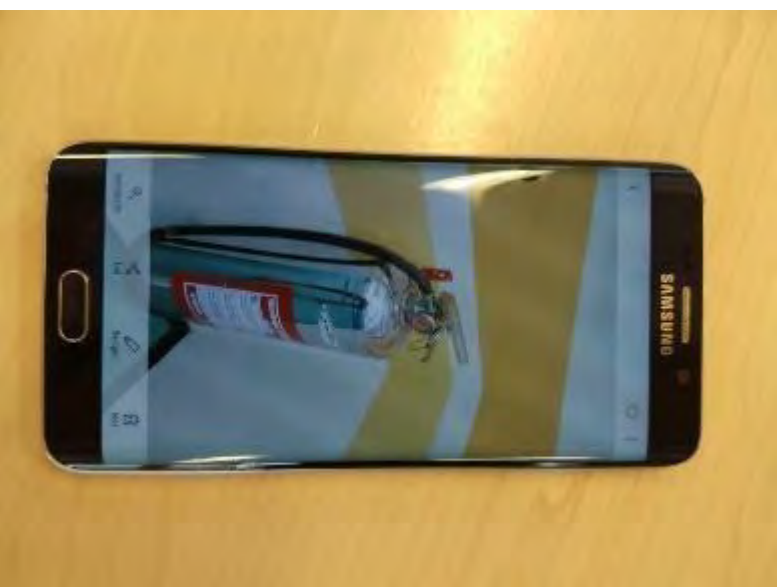
Majkens students have found a lot of reflective objects at school, and we were able to see some of the drawings



Majkens students have chosen six items they hope the Finish students will rank after their usefulness as mirrors.

•To Kirsi and her students

Would you please order these alternatives for mirror according to how useful you find them? Beside this we would like to know if your bicycles helmets look like ours, how your blackboards and fire extinguishers looks like and if your teacher does something special to get your attention (Majken rings the bell)



16/11-20 [shared document]

I write some comments for the Finish escape room and adds some more ideas for escape room tasks:

Suggestions - Majken

I think it is very important that we make some worksheets or something that makes it very easy for other teachers to use.

Don't think about the animals mentioned, I am thinking about changing the numbers on the lock to animals where the task also gives a clue about the animal.

-

“Shooting” little pictures of men with a fixed laser only moving mirrors. Can we perhaps make a A3 that can be hanged on the wall, so it is easy for the next teacher to use it?

- Hitting fish with lasers through - bending light through - is this possible? Perhaps if the water is colored or mixed with milk?

- With bending mirrors make a mirror house for Lego people - a funhouse where different mirrors make the Lego people look funny
- Making a device that will enable the students to see around corners. Animal: hippopotamus because it can see both forward and backwards at the same time
- Making total reflection.
- Making things invisible. Chameleon almost being invisible.
- Making a rainbow (only giving the students the materials and perhaps the story of Newton). Animal: dove because it was Noah's pact with God

Which color do we see first, when a dark room is being lit? a cat whose eyes reflect light at night <https://illvid.dk/dyr/hvorfor-lyser-dyrs-øjne-i-mørke>

16/11-20 [email]

Kirsi sends an email telling she is planning the escape room focusing on problem solving with mirrors. To the emails she attaches a figure of the “Top 10 skills of 2025” where 5 out of the ten skills are typed as problem-solving

16/11-20 [skype]

Kirsi and I talk about how the escape room can be interpreted, so it is possible to do in school. Kirsi has thought about using card boxes to divide the different rooms. I do not think this would be possible at my school where I only have 1,5 hour a week in a room where big settings must be removed when class is over to make room for the next class. Perhaps it could be possible to print at 3D lock? If Kirsis students later would wish to try our escape room, my students could put a little thing in it for Kirsis students and we could send it to Finland, who had to solve the problems to get the code for unlocking the lock.

Majken wrote Kirsi telling me, that she found a template for a lock online, and my printer is already printing.



18/11-20 [shared document]

Adding a new lesson plan and inviting the Finish students to play mirrors on Teams:

- Discuss in class how useful the different items are and arrange them in order of usefulness. Write down or record the arguments for choosing this order.
- Compare with the finish students ranking.
- Professional concepts: Incident ray, reflected ray, angle of incidence, angle of reflection
- Hands on: Mirror and light source. Draw the beam path in different lineups. Write down how the angle of reflection depends on the angle of incidence (The law of reflection)
- Working Together Apart: 3.A and 3.B want to invite the finish students to be their Teams-mirrors when they do everyday movements they would typically do in front of the mirror - like brushing their teeth, combing their hair, washing their face and making grimaces.*

18/11-20 [email]

Kirsi writes a mail telling Majken, they will rank the mirrors and send them tomorrow. Kirsis students have already looked at the pictures and asks what kind of tiles we have. The tiles looked very much like mirrors in the picture, they thought.

18/11-20 [email]

Majken answers Kirsi, that their tiles are made of small rocks glued together with concrete. In one of the pictures a puddle is laying over the tiles making them look like mirrors. In the picture with the large shadows students of Majken thought the shadows were like mirror-reflections, which is why we next lesson will talk about how shadows and reflections differ. If the tiles themselves look like mirrors, perhaps it is because it has just been raining when the picture was taken.

18/11-20 [email]

Kirsi write to Majken Escape room 1 is ready for test.

22/11-20 [shared document]

Kirsi shares pictures and descriptions of escape room made by 6 year old students:

Worksheets are important and we must value the questions of children, so it is important to listen to the pupil and write down what they are asking and try to solve the questions of them. Someone of the task could be explained to the small group of children. So that one group- pupils is visiting the “workshop” of mirror, water and rainbow, the other one is visiting the periscope. Pupils could be experts of different tasks and teach them to the others.

19.11.2020
Children planned tasks to Escape room of Time Machine

- 1. Make yourself to fly with mirror
- 2. Wing of butterfly- make it fly with mirror



It is said that when butterfly is flapping the wings it may change the conditions and create something new. (A Small change in initial conditions can create significantly different outcome.)

Welcome to the room of secrets. Let's find out what kind of skills we will need in the future. Then task 3 go to the time machine made by children. Put the flashlight on and try to find the hole of key. (mirror against the hole).

Welcome to the room of secrets. Let's find out what kind of skills we will need in the future. Then task 3 go to the time machine made by children. Put the flashlight on and try to find the hole of key. (mirror against the hole).

Light hole of key (this is a mirror) – the reflection goes to the floor- you will find an arrow

Go to the room.

..

Welcome to the room of secrets. Let's find out what kind of skills we will need in the future. Then task 3 go to the time machine made by children. Put the flashlight on and try to find the hole of key. (mirror against the hole).

Light hole of key (this is a mirror) – the reflection goes to the floor- you will find an arrow

Go to the room.
..

3. task 3 try to find the laser pointer. (Attached to the certain direction where is small mirror, put the laser on, one of the pupils is holding the pointer and watching to the small mirror, everyone else is looking the opposite direction and they will give advices to the pupil holding the pointer so that the light on the opposite wall will go to inside the frames, when the light goes to the frames you can read the text)

Light hole of key (this is a mirror) – the reflection goes to the floor- you will find arrow

Go to the room.

..

3. task try to find the laser pointer. (Attached to the certain direction where is small mirror, put the laser on, one of the pupils is holding the pointer and watching to the small mirror, everyone else is looking the opposite direction and they will give advices to the pupil holding the pointer so that the light on the opposite wall will go to inside the frames, when the light goes to the frames you can read the text)

4. When red light of the laser pointer is inside the frames. You can read the text. Put the UV-light on!

Light hole of key (this is a mirror) – the reflection goes to the floor- you will find arrow

Go to the room.

..

3. task 3 try to find the laser pointer. (Attached to the certain direction where is small mirror, put the laser on, one of the pupils is holding the pointer and watching to the small mirror, everyone else is looking the opposite direction and they will give advices to the pupil holding the pointer so that the light on the opposite wall will go to inside the frames, when the light goes to the frames you can read the text)

4. When red light of the laser pointer is inside the frames. You can read the text. Put the UV-light on

5. There is a text: Put the shining numbers in right order from smallest number to the biggest number. When to numbers are in right order turn the numbers around. There are now a text. that leads you to the periscope We got 0, 6

and 8 and the opposite of numbers was text PE -RIS -COPE



6. Go and find a periscope and place it to the rectangle. Watch through the periscope, what do you see? (answer:

rhombus)

Actually, we had to attach the periscope, otherwise the direction changed too much. The pupils saw the shape (everyone had a turn to watch-and they built same kind of shape using the cubes and the small mirror



Make same kind of shape-

Near the periscope was a lure (fishing equipment with mirror like surface). We got a fish with that.
. Inside of the mouth of the fish was a key and we found marshmallows and text of future skills.



- You will need curiosity
and we discussed this and other future skills:
"The OECD Learning Compass 2030 distinguishes between three different types of skills (OECD, 2018[1]):
- cognitive and meta-cognitive skills, which include critical thinking, creative thinking, learning-to-learn and self-regulation
 - social and emotional skills, which include empathy, self-efficacy, responsibility and collaboration
 - practical and physical skills, which include using new information and communication technology devices"

Inside of the mouth of the fish was a key and we found marshmallows and text of future skills. You will need curiosity and we discussed this and other future skills:

“The OECD Learning Compass 2030 distinguishes between three different types of skills (OECD, 2018[1]):

- cognitive and meta-cognitive skills, which include critical thinking, creative thinking, learning-to-learn and self-regulation
- social and emotional skills, which include empathy, self-efficacy, responsibility and collaboration

- practical and physical skills, which include using new information and communication technology devices”

20/11-20 [email]

Kirsi sends her students' ranking of the reflecting objects:

First the questions

Finland: We have different kinds of helmets. We tested after the hypothesis that black helmet could be used as a mirror. But it was not good.



Our blackboards are actually whiteboards and fire extinguishers look like red and white.

Kirsi-teacher uses the bell when she wants us to listen and when we are going to the forest on Tuesdays the ring of the bell gathers us together to the queue.

Sometimes Sanna-teacher claps her hands in a certain rhythm, and we join the clapping and listen to her.

We made hypotheses of best items used as mirrors and discussed those mirrors.

We were divided in small groups, so the 45 pupils did not listen to the answers of everyone.

<p>A bicycle helmet</p> <p>6. best 40/45 5. best 5/45 you can not see the colour it is not “shining” like mirror</p>	<p>A puddle</p> <p>3. best thought 45/45</p>	<p>A blackboard (CleverTouch)</p> <p>5. best 5/45 6. best 40/45</p>
<p>Tiles</p> <p>4. best 45/45 they are square. the look bright and reflective</p>	<p>A bell</p> <p>40/45 put this 1. 5/45 put this 2. best thinks that this is the best to be used as mirror.</p>	<p>A fire extinguisher</p> <p>5/45 put this 1. 40/45 put this 2. the whole human can be seen. here in Finland these are red</p>

24/11-20 [shared document]

The results from Denmark and Finland were listed in a table:

DK		Pros	Cons	FI
1	Puddle	<ul style="list-style-type: none">· Good reproduction - the image is not distorted.· It can be made with water from the water tap and you can make the puddle the size you want.	<ul style="list-style-type: none">· It only works after it has been raining.· When raining the surface is disturbed by water drops· The quality of the image depends on the material underneath the water and its color.· The colors are not clear	3
2	Bell	<ul style="list-style-type: none">· The colors are clear.· It is made of metal.· The face can be seen clearly.	<ul style="list-style-type: none">· The image is distorted due to the spherical shape.· Not everybody has a bell.	1
3	Bicycle helmet	<ul style="list-style-type: none">· A lot of people have one.	<ul style="list-style-type: none">· There are many different kinds made of different materials, different gloss and different colors.· There is no reflection in the airholes.· The usability decreases with age because scratches ruin the image.<ul style="list-style-type: none">· You cannot see the color.· It is not "shining" like mirror	6
	Fire extinguisher	<ul style="list-style-type: none">· Are found in many places, but not so many people have them at home.· The surface area is larger than the surface area of the bell.<ul style="list-style-type: none">· The come in different sizes.· The whole body can be seen	<ul style="list-style-type: none">· Many are red - not all are silver.· The image is distorted due to the cylinder shape.· There is no reflection where the warning labels are placed.· Scratches ruin the image	2
5	Blackboard (Clevertouch in DK)	<ul style="list-style-type: none">· The image is very clear when the colors are bright.	<ul style="list-style-type: none">· The image appears foggy and indistinct.· The mirror image is only clear when the screen is turned off.· A screen is really expensive, so not many people have them.<ul style="list-style-type: none">· Reflects strong colors best.· Requires bright light to give a sharp image.<ul style="list-style-type: none">· Difficult to move.· The colors are not clear	6
	Tiles	<ul style="list-style-type: none">· Clear shadow image· They are square.· On the picture taking after a rain shower, they look bright and reflective.	<ul style="list-style-type: none">· You can neither see colors nor details.· Nothing can be seen if the sun does not shine.· You need to have the sun behind you if you want to see anything.· The dimension of the image depends on the height of the sun	4

24/11-20 [email]

Majken writes Kirsi inviting her and her students to a Team meeting, where the students take turns being each other's mirrors while doing everyday movements they would typically do in front of the mirror - like brushing their teeth, combing their hair, washing their face and making grimaces.

Beside this, I suggest that we could work until Christmas or so developing different tasks to the escape room together with the students (like she is already doing) and afterwards choosing the best part to an escape room.

24/11-20 [email]

Kirsi accepts the invitation and tells that her students have planned to invite a school class to visit the escape room. Perhaps in December. Because of Covid-19 her class may not be there, so the instructions must be so good that the visiting group can survive by themselves.

30/11-20 [Teams]

Playing mirrors over Teams with lots of laughing students - what a thrill!

1/12-20 [Shared document]

Kirsi shares pictures from the mirror playing on Teams.

3/12-20 [email]

Kirsi write to check if I have got the latest news from the competition and asks if my students can be in videos from the project.

3/12-20 [email]

Majken writes Kirsi that I have got permission from most of the parents, but I will need to check the pictures she wishes to use.

3/12-20 [email]

Kirsi sends pictures from the mirror playing on Teams.

5/12-20 [shared folder]

Majken creates a shared folder with pictures from the mirror playing on Teams.

7/12-20 [email]

Kirsi asks for permission to use three of the pictures from the shared folder.

7/12-20 [email]

Majken doublecheck that I have the parent's approval and lets Kirsi know that she can use the pictures in a video of this project.

7/12-20 [shared file]

Kirsi shares her student's diary.

7/12-20 [email]

Kirsi sends her students project video and her video of good practice.

9/12-20 [email]

Majken writes Kirsi to let her know, that I have a lot of thoughts on how to make the video, but there are still so many things, I want to try out first.

Majken loves the escape room of Taipalsaari, and she is looking forward to hearing about how the try-out went. Unfortunately, an online gospel concert spoils some of planning of Majken.

10/12-20 [email]

Kirsi suggest that Majken sends task home with the students to test in order to get the testing done before Christmas.

14/12-20 [email]

Majken sends a draft of escape room of Denmark, draft has beautiful pictures /butterflies of pupils.

14/12-20 [email]

Kirsi sends the beginning of their story and tells that a class will try it out tomorrow.

The treasure mirrors are stolen. The Prince and princess real owners of mirrors gets clue where the mirrors are. Unique butterfly has come to lead the way to the mirrors if it is also possible to save the friends of butterfly too. Butterfly flies and big ship comes after that butterfly. When the Mirrorisland of robbers is ahead, sun is shining bright. The butterfly flies near the mirror of big ship and gives a signal to put the mirror right up. The robbers cannot see anything. The big mirror reflects the sun light to their eyes and the robbers are easily caught.

But the whole island is under some kind of magic. To get the mirrors back you must use your wisdom and you have to be able to do teamwork. When you solve the tasks of Mirrorisland the real owners of mirrors get their mirrors back but also the friend of butterfly is free again.

First task is to make the friend of leader butterfly to fly again with mirror. The butterfly must wave her wings really fast to be able to make action that makes a storm kind of reaction. For every action, there is an equal and opposite reaction. With waving the wings fast, magic curtains go away and you will see the keyhole that leads you to the next step. (there is a rope that also leads to the next step).

There are many kinds of mirrors on the wall. Point the mirrors and try to lead the reflection of red light to the frames on the opposite wall. When you have succeeded you are able to read the text. Text: Please put UV-light on. With UV-light you will solve next task. Put shiny numbers to the right order from smaller to bigger. (There are also letters and there are also numbers that are not shiny). When you are ready turn the numbers and you will get text: Go to the periscope!

Near the periscope you must look to the periscope and explain to the others what kind of shape there is. Of course, everyone can look. There is small and tall periscope. Which one is easier to see? Make same kind of shape with cubes and mirror.

Next task lock, you have seen the code of lock? Where was it? You are able to open the lock with code (the shiny numbers at certain order from smaller to bigger).

You found the prism; with the prism you are able to give colors back to the butterflies and make them live again. Use the prism and light. Now we won the magic and mirrors are treasures of princess and prince again. Butterflies are free and colorful!

25/1-21 [email]

Majken is writing about the project and asks Kirsi for a some of finnish lesson plans.

25/1-21 [shared document]

Kirsi shares some of the lesson plans.

26/1-21 [email]

Majken sends Kirsi a draft for the project description and asks for some specific pictures, which I send right away.

26/1-21 [email]

Majken sends Kirsi a draft for the project description and asks for some specific pictures, which I send right away.

Escape room [FI]

Approximately 8 groups of 6 students in three hours

The 6-year-old pupils have built the escape room in advance.

- 1.The story of the escape room is told in a movie.
- 2.With a big mirror make yourself fly.
- 3.Make the butterfly to wave the wings with mirror -> make a storm, magic is possible.
- 4.Try to find keyhole, I used the flashlight against mirror and pupils looked for the keyhole.
- 5.Laser pointer is next task, group is watching to the wall where is the frame, the one using laser pointer points the light of laser pointer against different mirrors, group gives advices of the right direction, aim is to get the light in the middle of frames.
 - There are many kinds of different mirrors made by pupils.
 - When the light of laser pointer is in the middle of frames, they are able to read: put UV light on.
- 6.There are shining numbers, UV light makes them visible.
 - Put numbers in the right order.
 - Turn numbers on, you can read PE RIS COPE
- 7.There are short and long periscope, look and describe to your friends what do you see. Picture is the same.
- 8.Build same kind of picture with cubes and a mirror.
- 9.Now you need a code; do you remember shining numbers. Put numbers to the keylock with numbers.
- 10.You will get a prism. Use flashlight and make a rainbow.
- 11.You have won the magic and butterflies are free.

Story of Denmark/ Escaperoom

The Heritage of Mirroria Once upon a time there was a small island called Mirroria. The island was not bigger than a couple of football fields, but nevertheless, it was home to the most colorful and eye-catching plants and insects in the entire world. The few people who managed to visit Mirroria described the island as stunningly beautiful and adventurous. If you believe in fairytales you would think it was the kingdom of the fairies. Had there ever been fairies on Mirroria they would however have vanished together with Mirroria in the violent storm that raged across most of the Earth's northern hemisphere for about 12.000 years ago. Only tales of the island remained, but as time passed by also the tales died out. Therefore, the tales of Mirroria have not been told in over 10.000 years. Or this was at least the case until the winter of 2020, where wizards and sorceresses suddenly started appearing across the world. Each one of them had an object which they claimed contained the heritage of Mirroria. All the objects were cylindrical and resembled tubes for parchment rolls, but they were impossible to open. The objects had different numbers on the outside which according to the wizards and sorceresses was a cunning locking system, that could only be opened by the true heirs of Mirroria. To get the combination for the lock you need to solve riddles and complete challenges that require teamwork, logical and creative thinking and clever brains. Are you and your classmates the true heirs of Mirroria?

It has been said that the flutter of a butterfly's wing can cause a typhoon halfway around the world. This effect is called the Butterfly Effect and according to legends the storm that led to Mirroria's disappearance was caused by the flap of a butterfly wing on the opposite side of the globe. Because Mirroria disappeared in a storm perhaps another storm will make it reappear. Can you make Mirroria reappearing by creating a storm using only half of a butterfly and a mirror? If you want to be able to create the same effect as a butterfly, you must be as fast as a butterfly. A Monarch flaps its wing approximately 300 to 720 times per minute. Can you be as fast as a Monarch? If you did not succeed in creating a storm you still have the chance of releasing the heritage of Mirroria. If you are a true heir you will be able to find the right combination for the lock. Here comes the first clue. The first number you will need is the number of wings indeed Two is not the number, I swear The butterfly's wings come in pair.

In 1669, the physicist Isaac Newton explained how white light sent through a glass prism was divided into colors. According to legends the fairies at Mirroria used this method to color the now extinct butterfly species Rainbowio with the colors of the rainbow. A true heir will be able to identify a genuine Rainbowio Using only a flashlight and a glass prism you must find the genuine Rainbowio below. The number of this butterfly is the second number you need to unlock the heritage of Mirroria

A true heir will be able to shield the heritage from its enemies. You now must prove this ability. The boxes around the animals are colored according to the kind of animal Shark Whale Toad Earthworm Jellyfish Bird (tit) When you have proven your worth - You are closer to given the heritage birth The number of enemies you shot - Is just a bit to much Retrack eighteen from the count Then you have the right amount This is the third number you need A little step closer, yes indeed Without removing the laser, you must shoot all the enemies of the butterfly. You can use as many mirrors as you like

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As you know a true heir will be able to shield the heritage from its enemies . This requires that you discover the enemies in time. You therefore have to make a periscope that allows you to keep an eye on enemies around corners HYPOTHESIS 1. The prettier the periscope is the better it works 2. The periscope and the mirrors must have the same cross-sectional area for the periscope to work 3. The heavier the periscope is the better an image you get 4. The lighter the periscope is the better an image you get 5. The longer the periscope is the larger an image you get 6. The longer the periscope is the smaller an image you get 7. If the periscope is cylindrical you need a round mirror for the periscope to work 8. The angle of the mirrors have no influence on whether the periscope works Only one of the hypothesis above is true. Find the right one and you have the fourth number, Juhu

The story of pupils of Majken was colourful and beautiful

If you are very fortunate, you are said to be born under a lucky star. As a true heir you must create the best conditions for the heritage Using only the pieces below and a mirror you must create a lucky star for the heritage to be born under. When you have the right form The heritage is ready to be born The last number are The number of tips on the star

<https://www.science-on-stage.eu/page/display/112/114/0/lilus-house-additional-materials>

https://www.science-on-stage.eu/images/download/ws17233_SonSDE_Broschuere_SpracheGS_EN_WEB.pdf

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