ISSN 1831-9424

European Commission

Laboratories for the future

Science, creativity and foresight through the eyes of the youngest generation

April 2024

Joint Research Centre

EUR 31935 EN

Contact information
Name: Dr Andreas Jenet
Address: Joint Research Centre, European Commission, Rue du Champ de Mars 21, 1049 Brussels, Belgium
Email: andreas.jenet@ec.europa.eu
Tel.: +32 2 299 11 11

EU Science Hub
https://joint-research-centre.ec.europa.eu

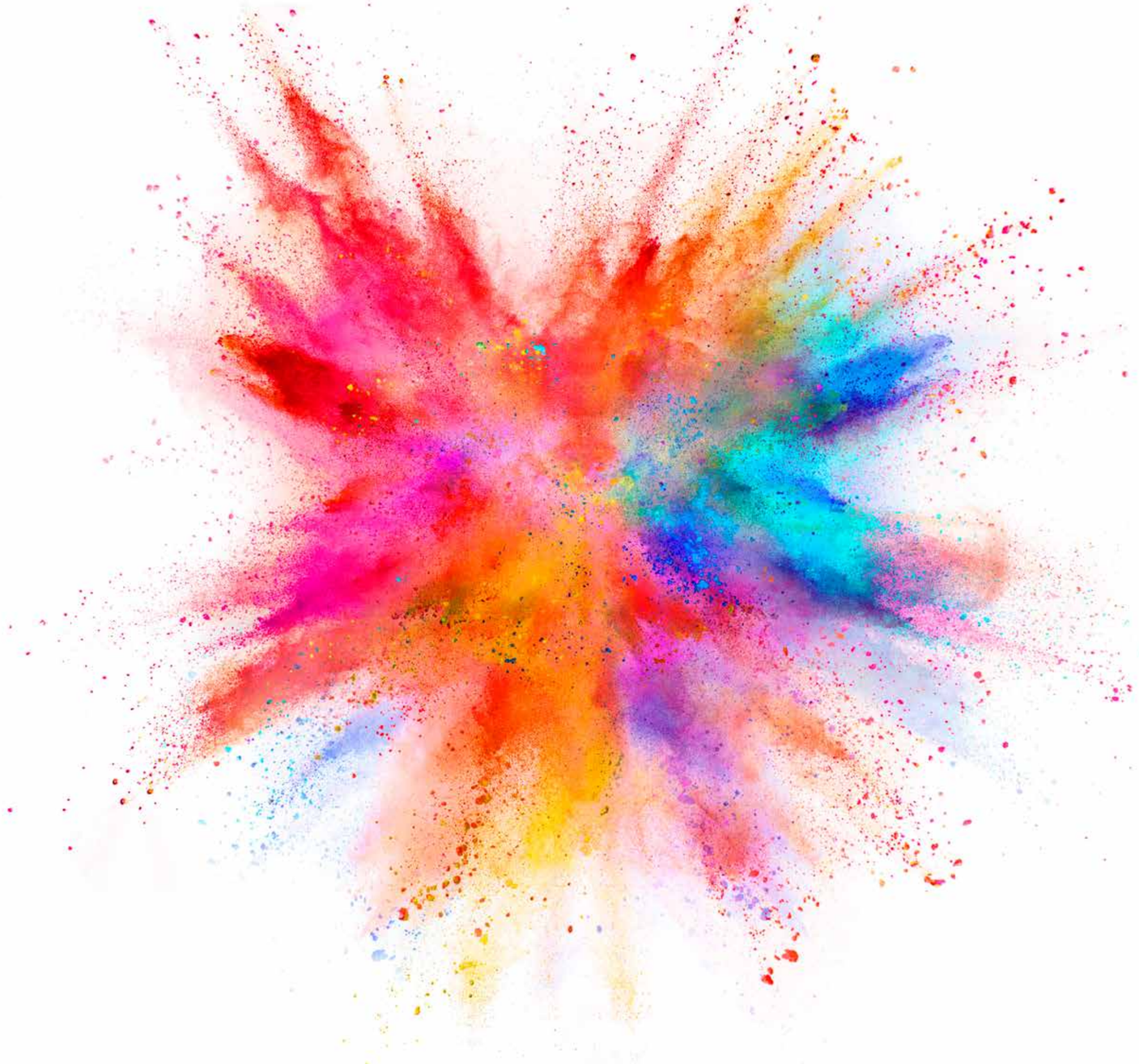
JRC137869
EUR 31935 EN

Print	ISBN 978-92-68-15935-4	ISSN 1018-5593	doi:10.2760/342955	KJ-NA-31-935-EN-C
PDF	ISBN 978-92-68-15934-7	ISSN 1831-9424	doi:10.2760/364096	KJ-NA-31-935-EN-N

Luxembourg: Publications Office of the European Union, 2024

How to cite this report: European Commission, Joint Research Centre, Jenet, A., Van Der Schoor, R., Sejersen, A., Perez-Medina, M. and Taucer, F., *Laboratories for the Future*, Publications Office of the European Union, Luxembourg, 2024, https://data.europa.eu/doi/10.2760/364096, JRC137869.

CONTENTS



FOREWORD

This publication was first conceived by the Laboratory Coordination Board at the Joint Research Centre's Science Summit in June 2022. At this conference, discussions were held about the role of the JRC in the science of tomorrow and the strategic priorities to shape the future. A great deal of foresight was necessary. To include the view of the generations of tomorrow, this initiative was set up to gather the perspectives of children, who will benefit from the research results of the JRC.

Children in their final year of primary school and their first year of secondary school in three European schools in two different countries were asked to draw the laboratories of the future. We received over a hundred artworks expressing what the students think about what are probably the most interesting and challenging problems of their time. In their drawings, the schoolchildren reveal how they envision the future of science and the world more broadly, and what role they see for the researchers and laboratories of tomorrow. We were deeply impressed by their creativity, both artistically and technically, in terms of the ingenious inventions they came up with. We are grateful to all who participated in this initiative and shared their thoughts and imagination with us.

Since the Science Summit, the JRC has reorganised to work more in interdisciplinary portfolios. The drawings created by the schoolchildren align well with these interdisciplinary working groups. Therefore, the publication follows the structure of the portfolios of the JRC, while we will also link every drawing to one of the JRC's laboratories and the research they conduct. The artworks can serve as an inspiration, as an anchor, as a North Star, and as a reminder of why we are doing our work: to create a better planet for our children.

We want to thank the teachers and pupils of the European schools of Bergen, Berkendael, Uccle, and Mol for their cooperation and their provision of artworks that exceeded our own imagination. This publication is supported by Portfolio "Innovation in policy making" and its project Learning & Sharing.

INTRODUCTION

Children have the capacity to actively imagine and be creative, and they certainly showed both in the drawings we received. They offered solutions to the major challenges we face today, sketched new technologies that can improve our daily lives, and even anticipated problems that the Joint Research Centre (JRC) has not yet foreseen, such as finding food for baby dinosaurs and dealing with "killer butterflies". For most of the ideas, the JRC has laboratories that already work to, or could with some efforts, provide solutions to the challenges that face us today. This also shows that the Commission Priorities and JRC's work plan correspond well to the ideas and analysis of the children. Following the fact check of the children, the JRC possesses a wide range of laboratories that are able to respond to a rapidly changing world.

The drawings were not only creative and imaginative, but often interdisciplinary. The JRC is working across disciplines in "portfolios" that combine knowledge from different scientific units to work towards a common theme, such as "zero pollution", "cybersecurity" and "health crises responses". Every drawing in this publication is linked to not only a Commission priority, but also to one or more JRC laboratories and portfolios. Like the JRC, the children are interested in identifying current and future problems and coming up with solutions to these.

Main themes in the artworks are pressing issues such as climate change, pollution, and healthcare. These are challenges that the children will be facing in the course of their lives and that scientists and policymakers need to work on to reduce their negative impact. If not, many children fear that Earth will become inhabitable. It is striking that space exploration, a classic theme in science fiction, is not depicted because the children think it is cool or fun, but because they think it will be absolutely necessary.

The laboratories of the JRC are already working towards solving the pressing issues our globe faces today, but could still take suggestions from the children on how to redirect their energies or optimise their work. For example, the JRC employs more than two thousand people dedicated to science. Of these, only 550 are women. In the drawings of the children, however, many of the scientists appear to be female. It is great that in the minds of the next generation, a scientist can be of any gender.

The children are also aware of the consequences of their inventions and try not to do any harm. A pupil who proposed a household robot made sure to add "If you were wondering, no they will not take over the world". Even on a smaller scale, many children added a waste bin in their drawings, showing how they also align with the goal of reducing pollution.

Where some children drew the solutions that scientists should work on, others took the assignment in a different way and drew what they think a laboratory of the future will look like. Often, the drawings contain typical science attributes that current laboratories have, such as conical flasks, beakers, laboratory coats, and computers. Some, however, also have robots working in the labs, alongside humans or replacing them entirely, or have machines that do not yet exist. These robots and machines would first need to be invented – by scientists, of course.

As in the priorities of the European Commission, the children seem to have green solutions as the goal, and digital devices as the method. They are also very concerned with health, potentially due to their experience with the COVID-19 pandemic. Some offer smart ideas that could be sold on the market, like household appliances. Economic aspects are not central in their views. The children seem less concerned with priorities for "A stronger Europe in the world", which includes international relations and developmental aid, nor for "A new push for European democracy", which focusses on human rights, equality and citizen engagement. These topics are too abstract or bureaucratic for children. These topics are not directly linked to physical research infrastructures: the JRC has only a few labs that focus their work on social science priorities, where research in social science is done in a participatory way. Nevertheless, there are several JRC portfolios working on them, such as those of innovative policymaking and international cooperation, sustainable and trusted connections.

This catalogue of drawings aims at showing the imagination of children and how their ideas of the future can be a reminder when steering the strategy of JRC's laboratories. Moreover, the publication highlights that the JRC with its laboratory capacities tackles issues that Europe will face in the future.

Finally, in case we made you curious to learn more about the JRC labs, we invite you to visit the JRC Science Hub, where we showcase our research infrastructures.

CHAPTER 1

A EUROPEAN GREEN DEAL

The von der Leyen Commission has made the European Green Deal its top priority in response to the global threat of climate change. The goal is to combat climate change and minimize its impact on the environment, ensuring a habitable Earth for future generations. The Green Deal strives towards net-zero emissions of greenhouse gases by 2050, to decouple economic growth and resource use, and to ensure that no person and no place are left behind. Priority projects include promoting a green recovery after COVID-19, providing affordable and sustainable energy, supporting healthy food systems, achieving climate neutrality, protecting biodiversity, and promoting efficient and environmentally friendly transport. Many of these are explicitly coupled with the digital transition: they are considered "twin transitions".

No other priority of the Von der Leyen Commission corresponds so well to the concerns of the children in this project. About half of the drawings from the children that participated in the project are related to problems such as pollution, overuse of resources, and biodiversity loss. The JRC echoes these concerns, dedicating its work into finding and developing green solutions, safe and clean energy production, efficient mobility, sustainable cities, zero pollution, healthy biodiversity, sustainable food systems, and industrial transformation.

The JRC operates 53 research infrastructures, and many of them are instrumental in contributing to the goals of the Green Deal. For example, laboratories like the European Solar Test Installation, the Fuel Cells and Electrolyser Testing Facilities, the High Pressure Gas Testing Facility, Battery Energy Storage Testing laboratory and the Fuels and Materials Research laboratory work on finding alternative ways to generate and store energy. There are several laboratories that work on greener mobility and infrastructure, such as the Smart Grid Interoperability Laboratory, the EU Interoperability Centre for Electric Vehicles and Smart Grids, the European Laboratory for Structural Assessment: Large Hopkinson Bar Facility, the European Laboratory for Structural Assessment: Reaction Wall Facility, and the Digital Tachograph Laboratory. Multiple laboratories are working on topics such as pollution, healthy life and biodiversity, such as the Greenhouse Gas Flux Measurement Tower, the European Reference Laboratory for Air Pollution, the Vehicle Emissions Laboratories, the European Commission Atmospheric Observatory, the Water Laboratory, the EU Reference Laboratory for Alternatives to Animal Testing, the Nanobiotechnology Laboratory, the Water Laboratories, and the Marine Optical Laboratory.

The JRC also has laboratories, which investigate our food systems, such as the Food Fraud Laboratory, the Food Contact Materials Laboratory, the Genetically Modified Organisms Laboratory, the Tobacco Laboratory, and the Food Safety & Compliance Laboratory. Lastly, although

this was not a major concern by the children participating in the project, the JRC has several laboratories that work on nuclear safety and security: the Laboratory for Materials Ageing in LWR Environments, the Properties of Actinide Materials under Extreme Conditions laboratory, the Nuclear and Trace Analysis Facility, the Nuclear Reference Material and Measurement Facility, the Underground Laboratory for Ultra-Low Level Gamma-Ray Spectrometry, the Radionuclide Metrology Laboratories, the High Flux Reactor, the Liquid Lead Laboratory, the Micro-Characterization Laboratory, the Hot Cells Laboratory, the Tandem Accelerator Based Fast Neutron Source laboratory, the JRC Neutron Time-of-Flight Facility, the Nuclear Target Preparation Laboratories, the Structural Materials Performance Assessment Laboratories, and the Radio Spectrum Laboratory.

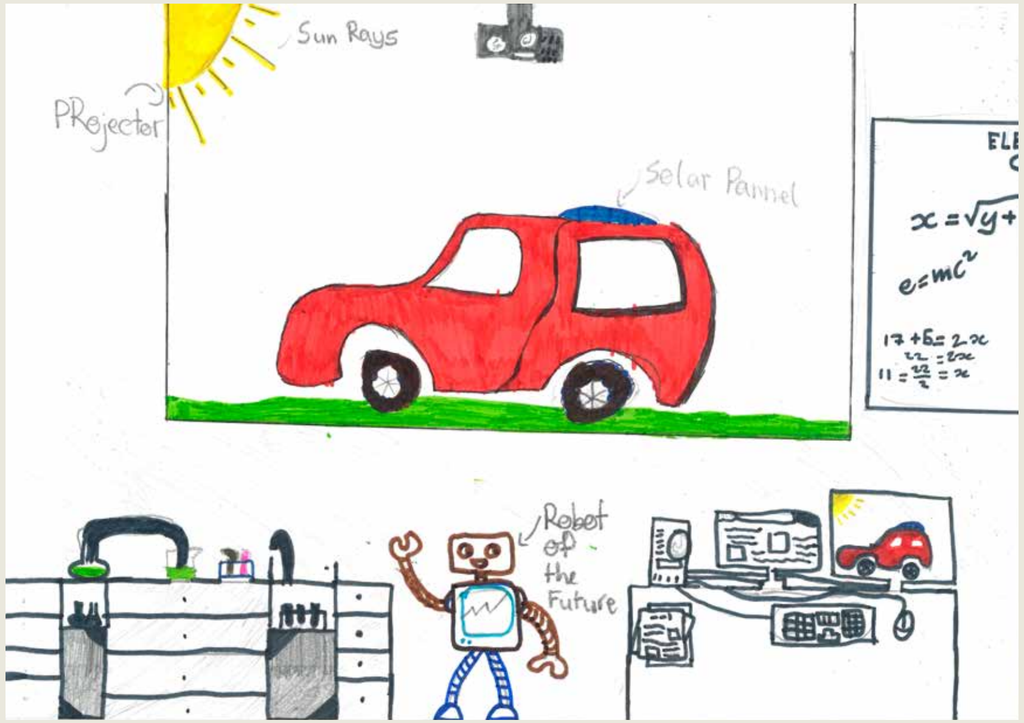
The drawings show an image of a generation that is very concerned about the future of the planet, but has great trust in the ability of science to develop solutions and technologies to respond to the pressing challenges that are ahead of us. Children look for alternative sources of energy, such as a "solar energised car", that is "100% Electric and uses 0% petrol", or a car "that runs on the energy in food". Many also offer ideas on alternative methods of transport: from rollercoasters to flying toenails and from bicycles to hoverboards. Many suggest that these solutions need to be invented by scientists: "I think scientists should try", or they mention a research infrastructure of the JRC. Many of the solutions proposed require digital methods, and thus correspond to the Commission's assessment that the green and digital transition are interlinked.

Apart from a resistance to fossil fuels, the drawings show a keen awareness of the importance of waste management and recycling. There is a house fully made of recycled materials that can also itself be recycled, and an artificial black hole for our waste. The need for new, better materials is also recognised, especially when it comes to water spillages, which multiple children mention as a major threat: "if we do not stop wasting water the problem will become worse and without water we will die".

The children are also fearful of pollution and its devastating effects, while many express hope that science will be able to stop air pollution. An example from the text in one of the drawings says: "I drew this picture because I want to stop air pollution. In my opinion cars make the air worse and worse, so scientists have to think how to stop air pollution and how to make the cars helpful for the Earth!". Others are not as optimistic: "In the future the whole Earth will be contaminated". The current and expected level of pollution leads some to feel as if scientists are not taking it seriously enough: one schoolchild wrote "I think scientists should be more concerned on nature and pollution".

Connected to this theme of pollution is the long-time child-favourite topic of animals and biodiversity. The children are worried about animals consuming plastic, so they look for alternatives to plastic or inventive ways to remove plastic from nature, such as through a robot whale that eats plastic and creates fresh water. When it comes to the decline in biodiversity, the children are aware of the human cause of this: "a lot of people are trying to kill the bees", for instance. The topic of saving the bees is a popular one. Many also mention that they want more research into animals and plants and their health and relation to humans.

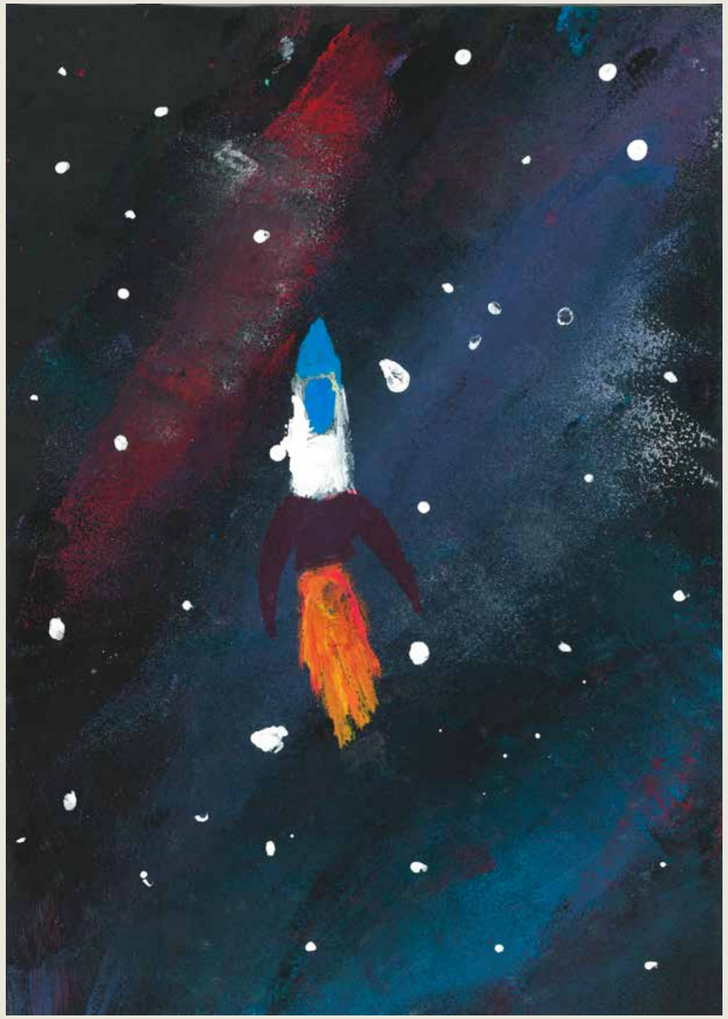
The JRC is playing an important role in rolling out the European Green Deal and its laboratories are of vital importance in achieving this. The drawings show that the interests of the Commission and those of the children are largely aligned, although the children are less interested in economic growth and more in protecting animals.



Idea: Solar Energised Car. The solar panel rotates 360°. It is 100% Electric and uses 0% petrol.
SCHOOL European School of Mol, Belgium

LABORATORY
European Solar Test Installation, ESTI

PORTFOLIO
2 – Energy solutions, 6 – Mobility



This is a rocket that runs on a more efficient fuel that lasts a lot longer than others. It runs 50% on solar energy and 50% on fuel.
SCHOOL European School of Bergen, the Netherlands

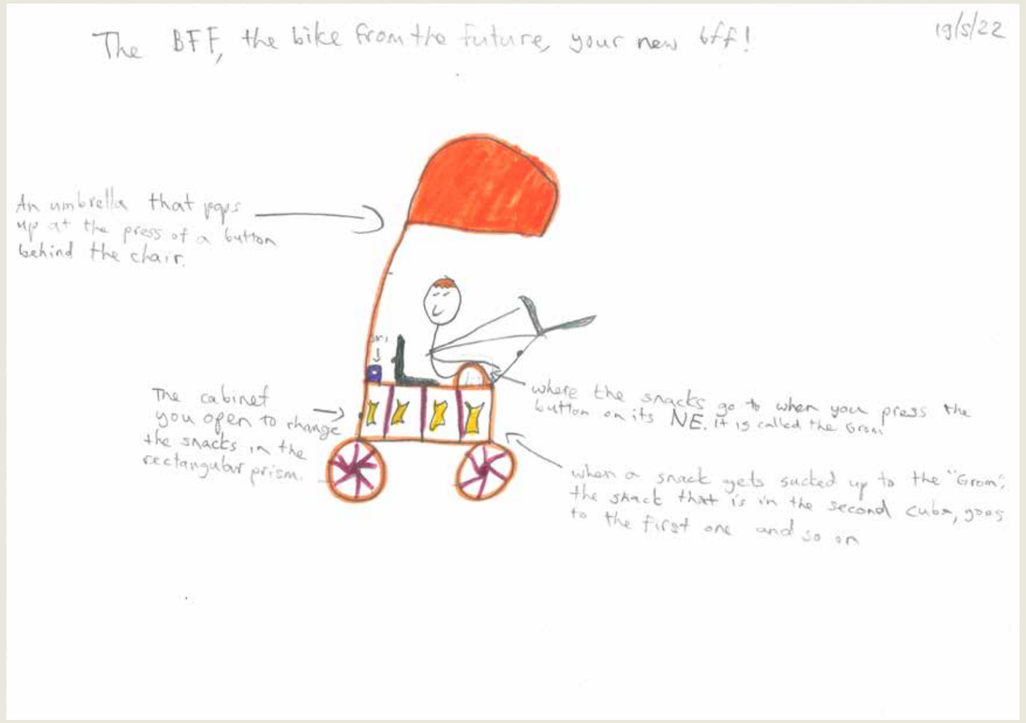
LABORATORY
European Solar Test Installation, ESTI

PORTFOLIO
2 – Energy solutions, 3 – Hydrogen, 18 – Earth observation, 19 – Galileo

This is my future city. It has flying cars and Rollercoasters as trains. The station is modern, and the buildings are made new.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Laboratory for Structural Assessment, ELSA

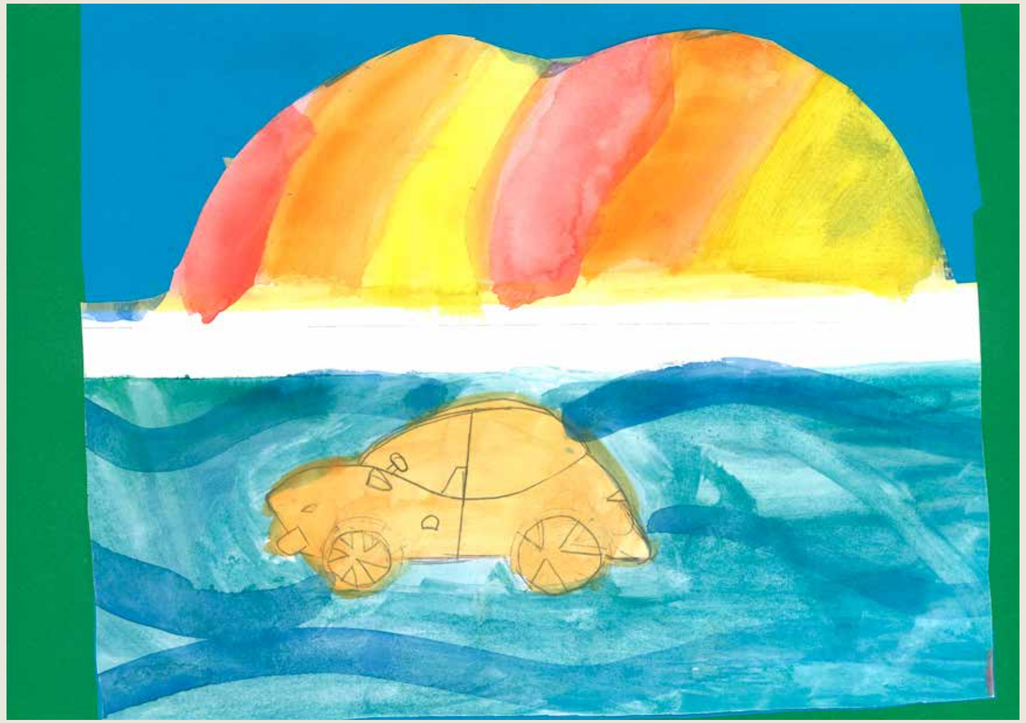
PORTFOLIO
6 – Mobility, 7 – Cities and buildings



The BFF, the bike from the Future, your new bff!", "An umbrella that pops up at the press of a button behind the chair", "The cabinet you open to change the snacks in the rectangular prism.", "where the snacks go to when you press the button on its NE. It is called the Grom.", "when a snack gets sucked up to the "Grom", the snack that is in the second cube, goes to the first one and so on.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
SMART GRID Interoperability Laboratory, SGILAB
Vehicle Laboratory - European Interoperability Centre and Advanced Vehicle Testing, VELA-EIC&AVT

PORTFOLIO
6 – Mobility



A future vision of laboratory where you can immediately arrive where you went using a future car.
SCHOOL European School of Bergen, the Netherlands

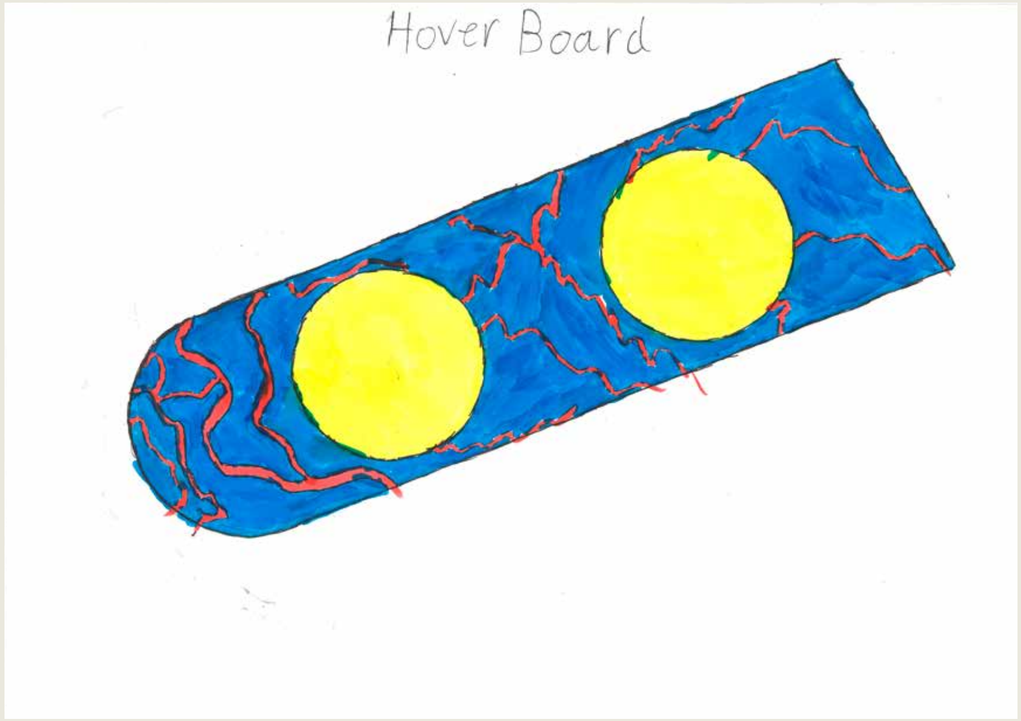
LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL-GNSS

PORTFOLIO
6 – Mobility

These magical feet/toes will be rather resourceful. Latch onto them and they'll take you wherever you want! :)
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Nanobiotechnology Laboratory, Nanobiotech

PORTFOLIO
6 – Mobility



The Hover-Board is a skateboard without wheels that hovers just over the ground.
SCHOOL European School of Bergen, the Netherlands

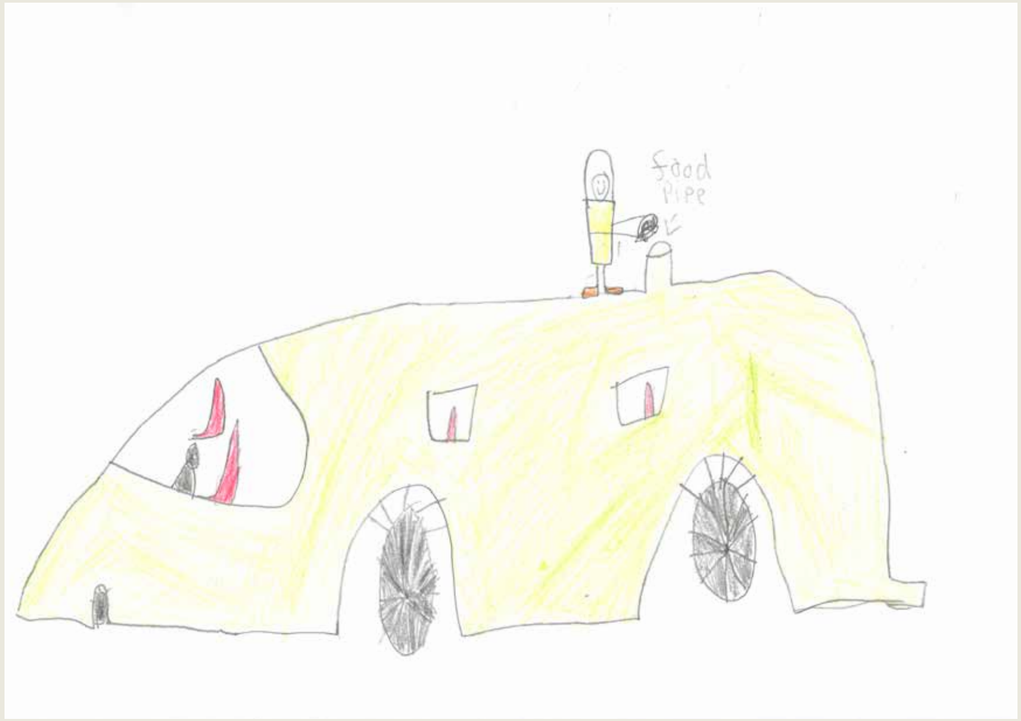
LABORATORY
SMART GRID Interoperability Laboratory, SGILAB
Vehicle Laboratory - European Interoperability Centre and Advanced Vehicle Testing, VELA-EIC&AVT

PORTFOLIO
6 – Mobility

Research on solar energy driven vehicles.
SCHOOL European School of Mol, Belgium

LABORATORY
European Solar Test Installation, ESTI

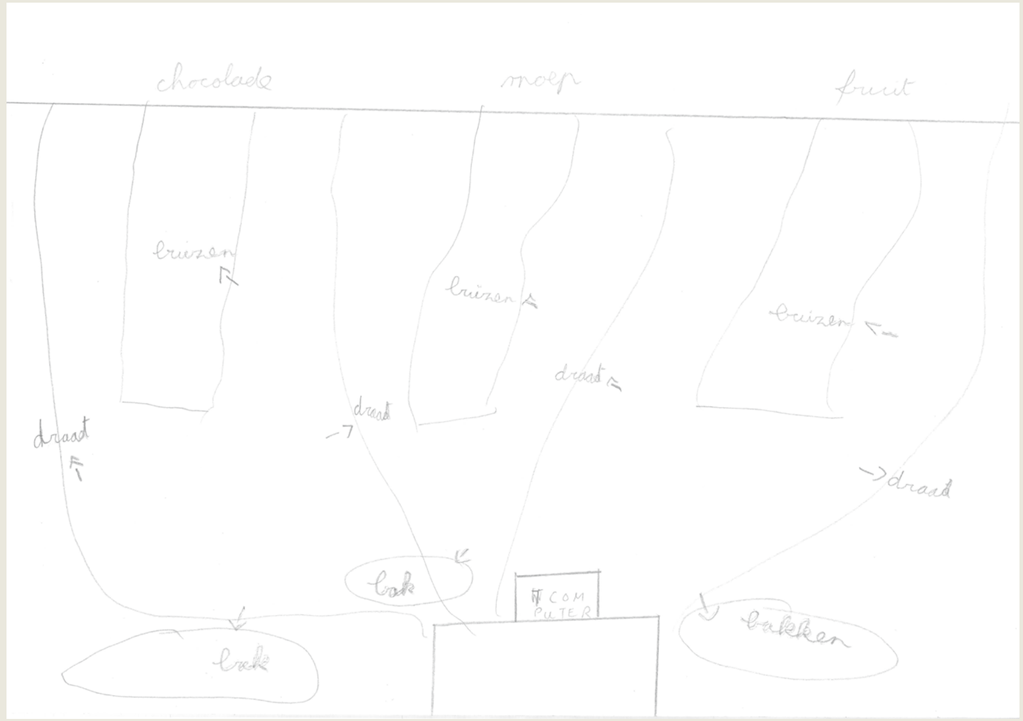
PORTFOLIO
6 – Mobility



Physics lab. I think scientists should try making a car that runs on the energy in food.
SCHOOL European School of Mol, Belgium

LABORATORY
European Solar Test Installation, ESTI

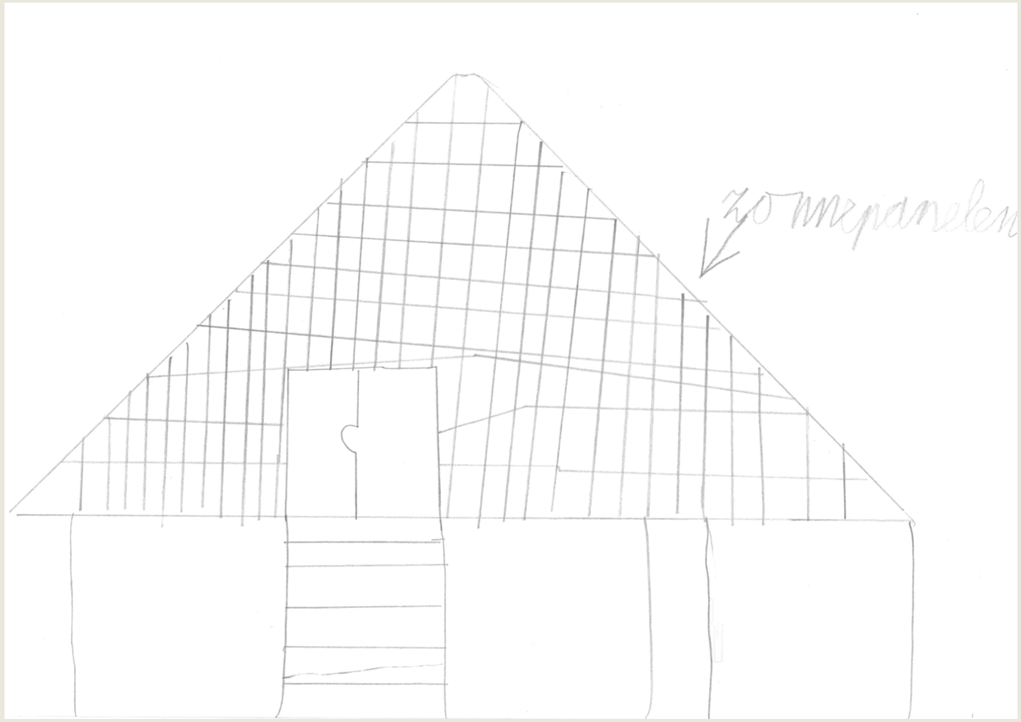
PORTFOLIO
2 – Energy solutions, 6 – Mobility



Digital food bank. It is to be able to quickly transport foreign food around the world.
The food is sorted into tubes and then it falls into a container, which is controlled by a computer.
SCHOOL European School of Mol, Belgium

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL-GNSS

PORTFOLIO
11 – Sustainable food systems, 19 – Galileo



Energy centre where they do research on sustainable energy.
SCHOOL European School of Mol, Belgium

LABORATORY
European Solar Test Installation, ESTI

PORTFOLIO
2 – Energy solutions

This house is fully made of recycled materials. It also can be recycled. The walls are from charcoal and the roof is made from plants.
SCHOOL European School of Bergen, the Netherlands

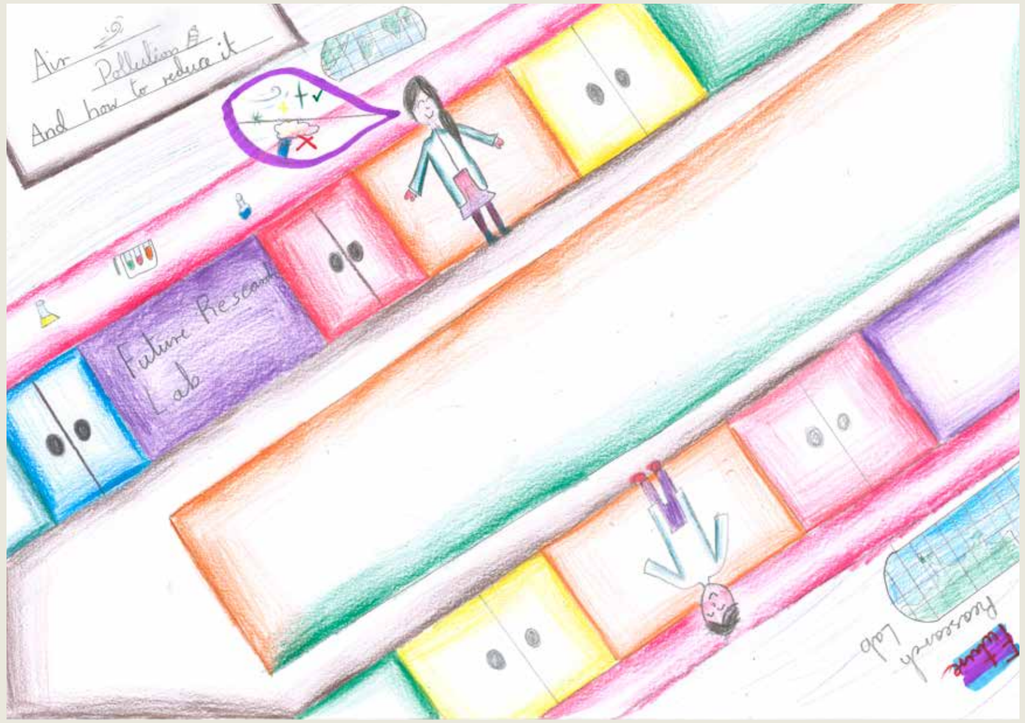
LABORATORY
T2 Open Space Laboratory, T2 Openlab

PORTFOLIO
7 – Cities and buildings, 12 – Sustainable materials

In the future the whole Earth will be contaminated. This is represented in this drawing of a city that is extremely contaminated.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Reference Laboratory for Air Pollution, ERLAP

PORTFOLIO
7 – Cities and buildings, 9 – Zero pollution



My Drawing is about air pollution. And how to reduce it.
SCHOOL European School of Mol, Belgium

LABORATORY
European Reference Laboratory for Air Pollution, ERLAP

PORTFOLIO
9 – Zero pollution

I drew this picture because I want to stop air pollution. In my opinion cars make the air worse and worse, so scientists have to think how to stop air pollution and how to make the cars helpful for the earth!
SCHOOL European School of Mol, Belgium

LABORATORY
Vehicle Laboratory - Market Surveillance, VELA – MaSU
Vehicle Laboratory - European Interoperability Centre and Advanced Vehicle Testing, VELA – EIC/AVT

PORTFOLIO
9 – Zero pollution

Bioscience lab. I think scientists should be more concerned on nature and pollution.
SCHOOL European School of Mol, Belgium

LABORATORY
Marine Optical Laboratory, MarLab

PORTFOLIO
9 – Zero pollution , 10 – Healthy biodiversity, 27 – Health crises responses, 28 – Life and health sciences, 29 – Cancer & non-comm. Diseases

Physics laboratory. I chose to draw this picture because a lot of water is being wasted: if we do not stop wasting water the problem will become worse and without water we will die. The attention of each individual is important but some wastes are involuntary. Scientists can help us to detect and stop this wastes.
SCHOOL European School of Mol, Belgium

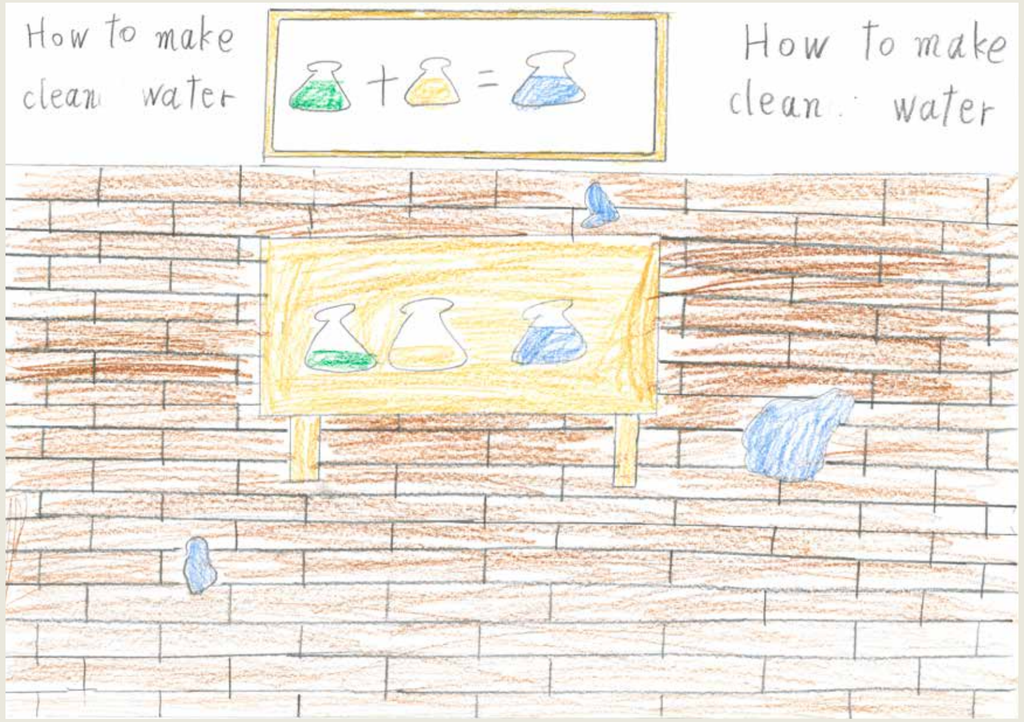
LABORATORY
Laboratory for materials ageing in LWR environments, AMALIA
Micro-Characterization Laboratory, MCL

PORTFOLIO
8 – climate neutrality, 9 – Zero pollution, 11 – sustainable food systems

Physics Labrotory. I want to make a new type of metal like a mixture of metals that makes it stronger for pipes so that we don't waste any water. Because leaking pipes waste over forty litres of water.
SCHOOL European School of Mol, Belgium

LABORATORY
Laboratory for materials ageing in LWR environments, AMALIA
Micro-Characterization Laboratory, MCL

PORTFOLIO
8 – climate neutrality, 9 – Zero pollution, 12 – Sustainable materials



How to make clean water.
SCHOOL European School of Mol, Belgium

LABORATORY
Water Laboratory, WaterLab

PORTFOLIO
9 – Zero pollution

This machine can make clouds that in very dry places like Afrika it can finally rain.
SCHOOL European School of Bergen, the Netherlands

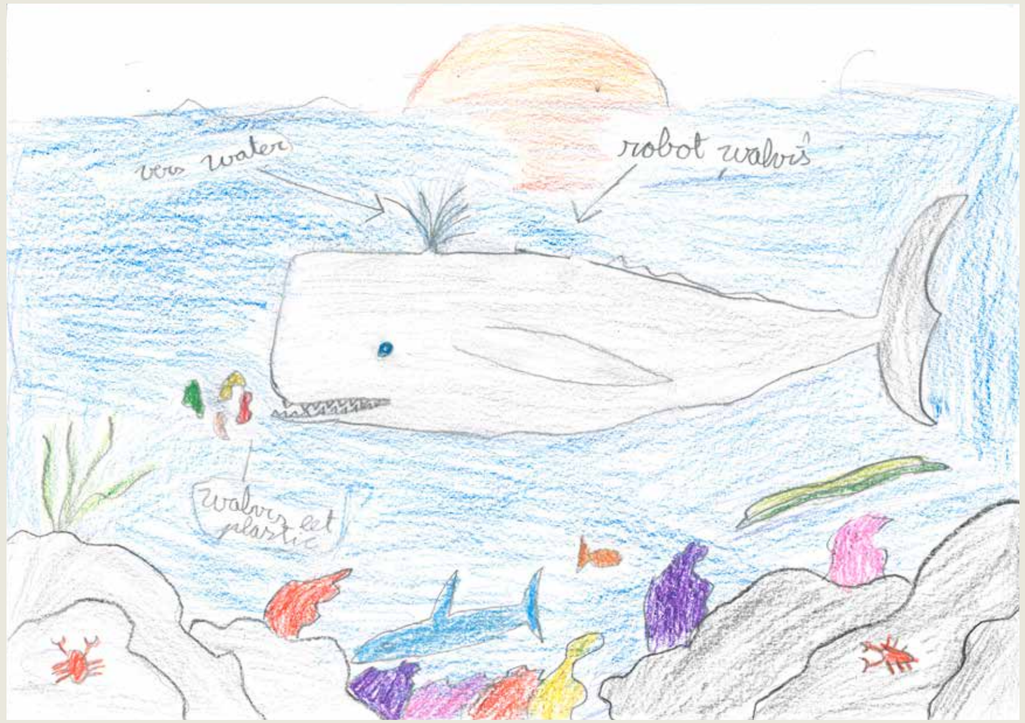
LABORATORY
European Commission Atmospheric Observatory, EC AtmO

PORTFOLIO
8 – climate neutrality, 9 – Zero pollution, 10 – Healthy biodiversity

I think this is important because animals eat the plastic and then when we eat fish we are pretty much eating plastic.
SCHOOL European School of Mol, Belgium

LABORATORY
Environmental biotechnology laboratory, EBL

PORTFOLIO
9 – Zero pollution, 10 – Healthy biodiversity, 11 – sustainable food systems, 12 – Sustainable materials



I drew a robot whale that eats plastic, sprays fresh water for the fish, and has a camouflage like a whale so as not to scare the fish. The goal for this drawing is a cleaner sea for the future and the world! :) :)
SCHOOL European School of Bergen, the Netherlands

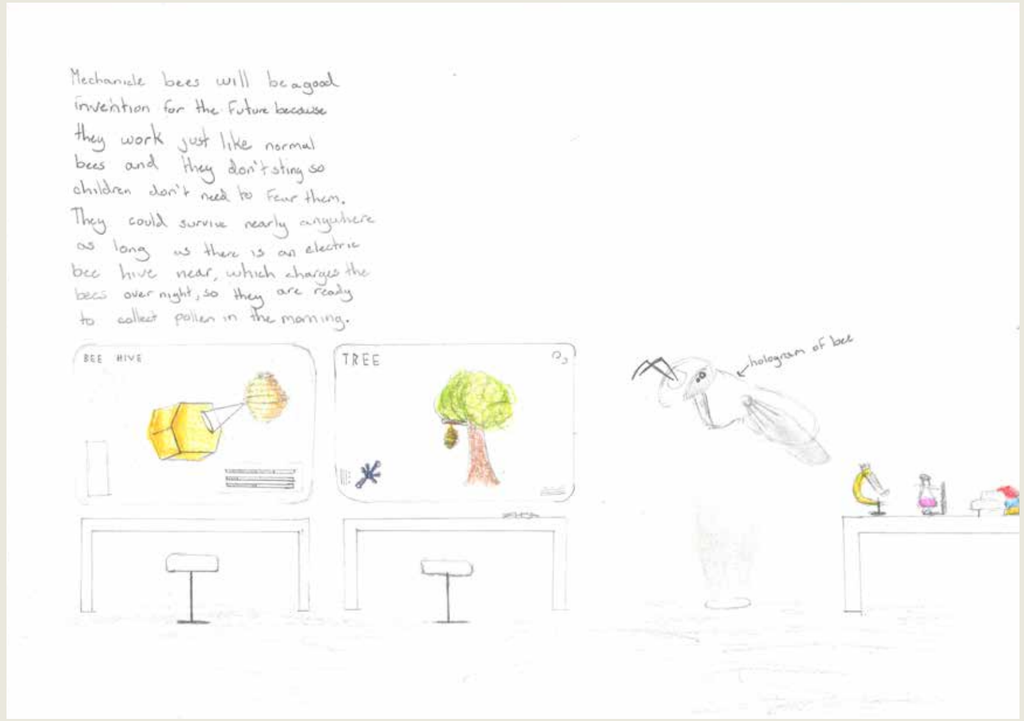
LABORATORY
Environmental biotechnology laboratory, EBL

PORTFOLIO
9 – Zero pollution, 10 – Healthy biodiversity, 12 – Sustainable materials, 14 – digital transition, 15 – Trustworthy AI

Apiologist (bee scientists). I thought saving the bees would be a great idea because a lot of people are trying to kill the bees. Without the bees we wouldn't have any food.
SCHOOL European School of Mol, Belgium

LABORATORY
Environmental biotechnology laboratory, EBL

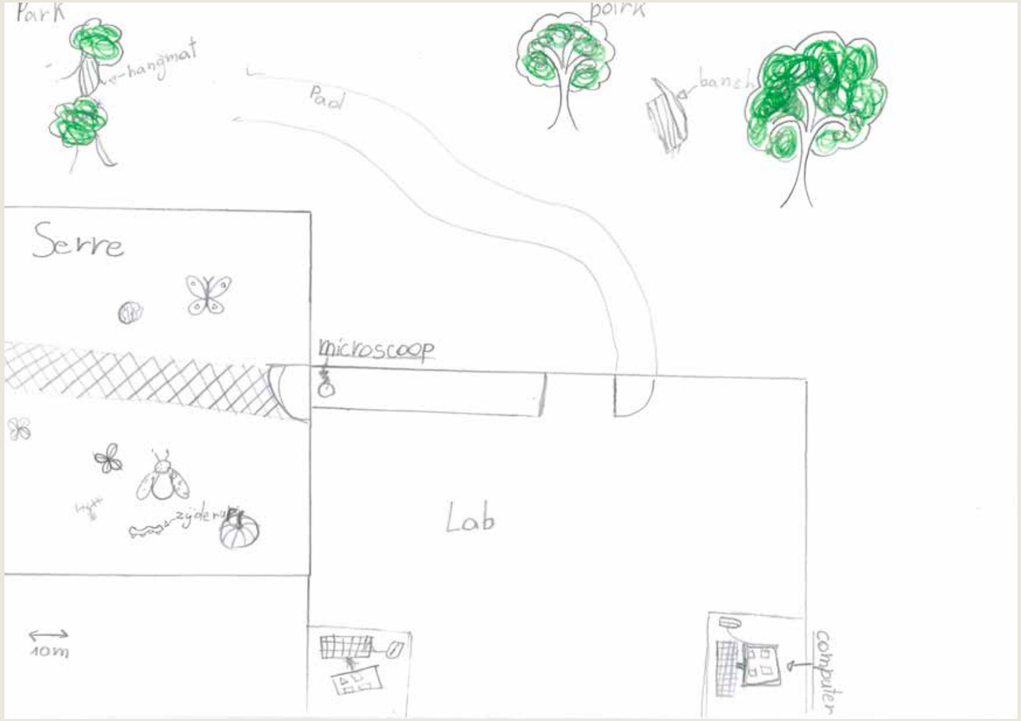
PORTFOLIO
10 – Healthy biodiversity, 11 – sustainable food systems



Mechanical bees will be a good invention for the future because they work just like normal bees and they don't sting so children don't need to fear them. They could survive nearly anywhere as long as there is an electric bee hive near, which charges the bees overnight, so they are ready to collect pollen in the morning.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS

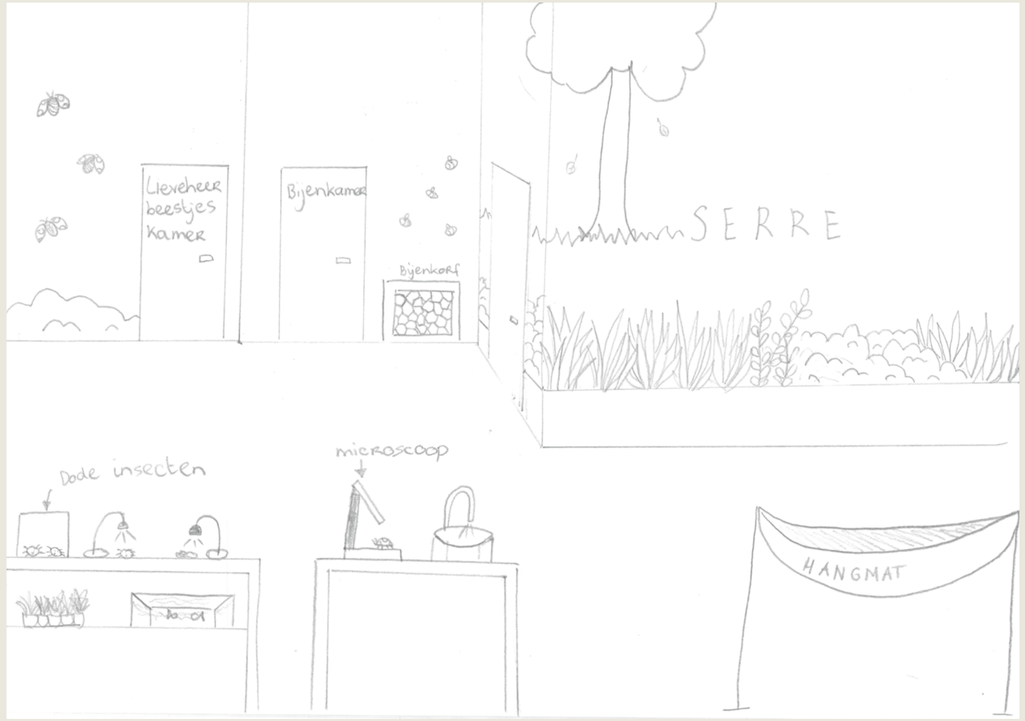
PORTFOLIO
8 – climate neutrality, 10 – Healthy biodiversity



A study of insects and plants. A greenhouse with plants and insects to investigate which insects go on which plants and how you can stop them. Also to see how you can make sure that you don't have to kill the silkworm to get silk and to make sure that insects don't transmit dangerous diseases.
SCHOOL European School of Mol, Belgium

LABORATORY
Environmental biotechnology laboratory, EBL

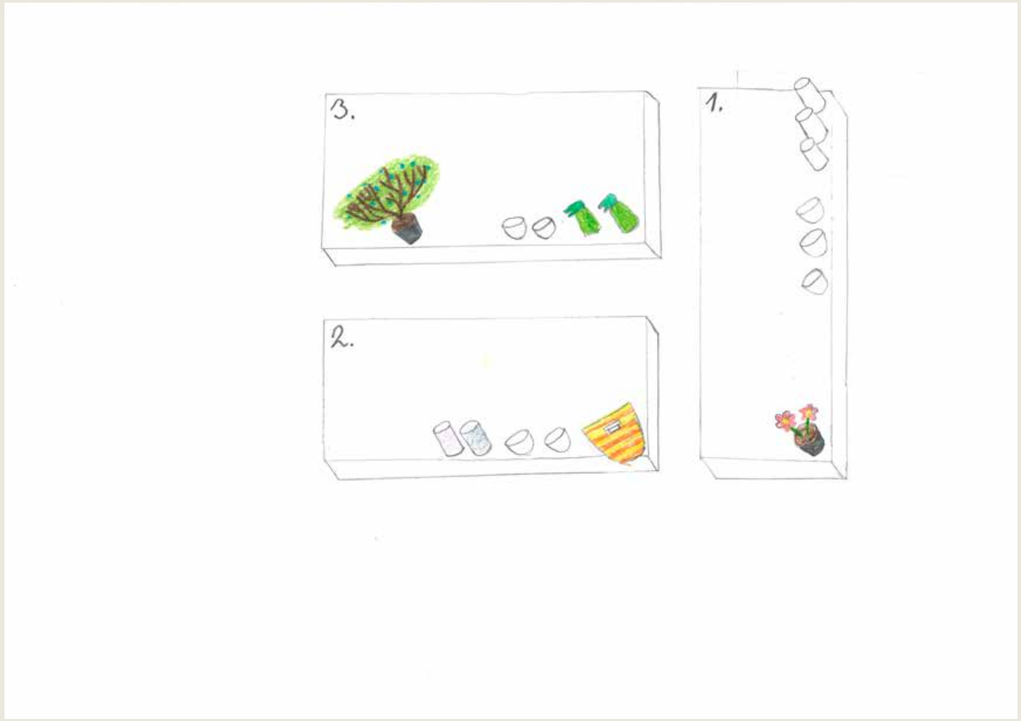
PORTFOLIO
10 – Healthy biodiversity, 28 – Life and health sciences



Studying Insects & Plants. Studying ladybugs and bees to know what is in them and to know if they also contain plastic. Whether you can make energy with plants.
SCHOOL European School of Mol, Belgium

LABORATORY
Environmental biotechnology laboratory, EBL

PORTFOLIO
2 – Energy solutions, 10 – Healthy biodiversity



At the 1st table, you can examine flowers so that they provide more energy for the bees.
At the 2nd table you can examine the bees.
At the 3rd table, you can study pesticides to make them more ecological.
SCHOOL European School of Brussels I, Belgium

LABORATORY
Environmental biotechnology laboratory, EBL

PORTFOLIO
10 – Healthy biodiversity, 28 – Life and health sciences

Bioscience Lab. I think in the future they should look and research about plants and viruses.
SCHOOL European School of Mol, Belgium

LABORATORY
Environmental biotechnology laboratory, EBL

PORTFOLIO
10 – Healthy biodiversity, 27 – Health crises management, 28 – Life and health sciences

Pflappu's laboratory. My lab helps the plants to cure the disease. A machine measures whether the plant has a disease and if so, which one. If the plant has one, then the machine sends the disease to another machine that gives the pill or the medicine.
SCHOOL European School of Brussels I, Belgium

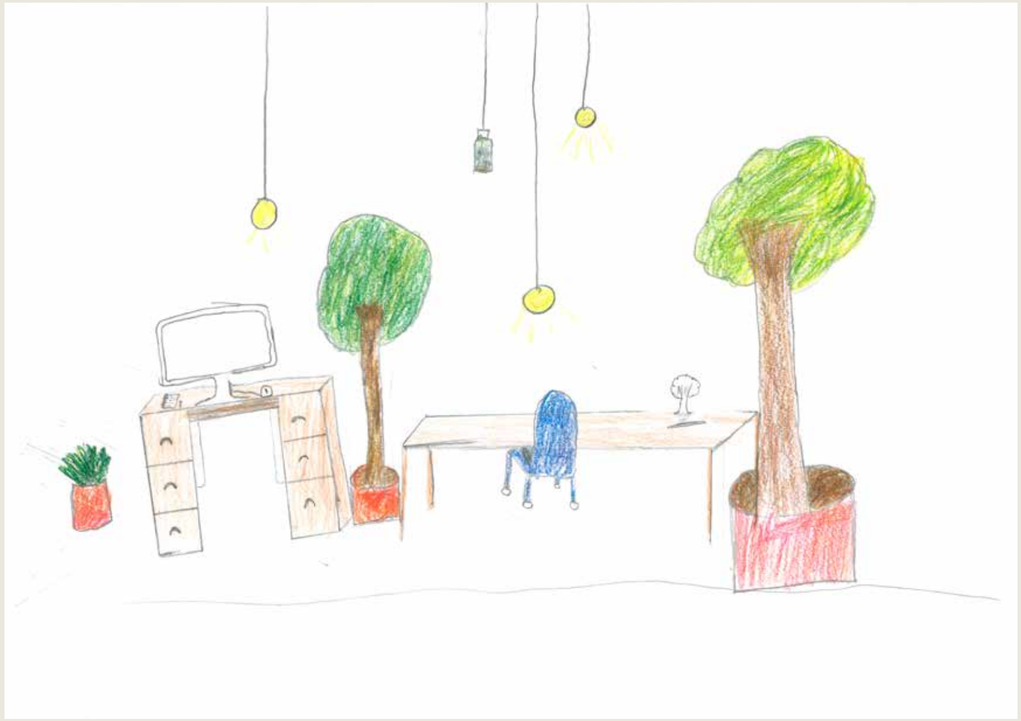
LABORATORY
Environmental biotechnology laboratory, EBL

PORTFOLIO
10 – Healthy biodiversity, 28 – Life and health sciences, 29 – Cancer & non-comm. Diseases

Bioscience Laboratory Of Plants. They are studying the features and chemicals of plants.
SCHOOL European School of Mol, Belgium

LABORATORY
Environmental biotechnology laboratory, EBL

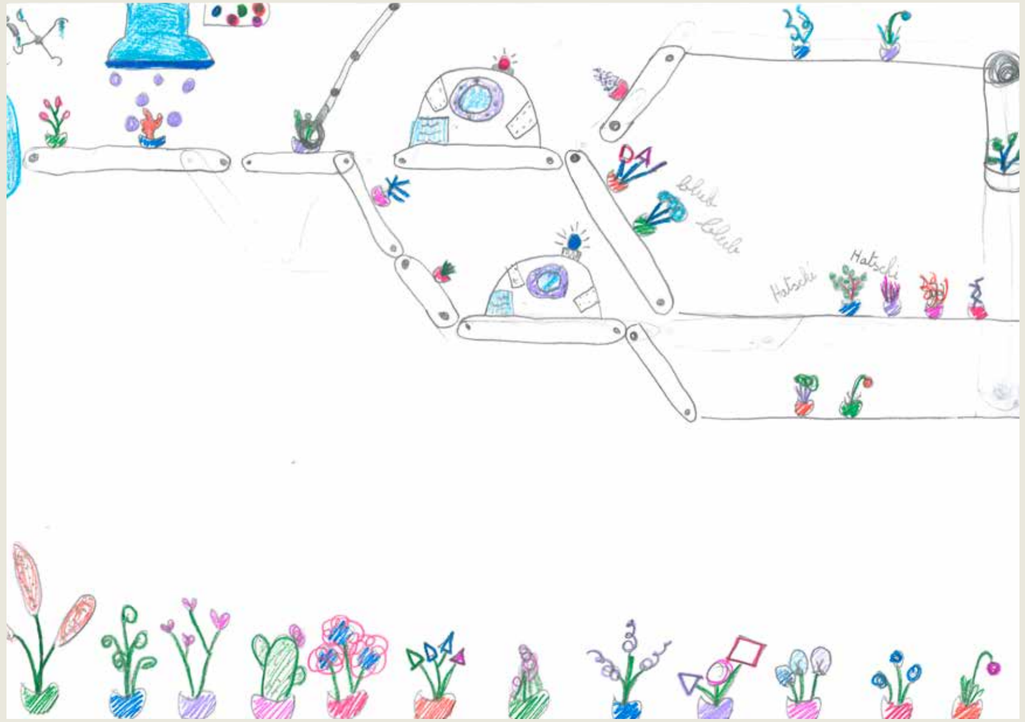
PORTFOLIO
10 – Healthy biodiversity, 11 – Sustainable food systems



Biology lab. They are researching how trees convert CO_2 into air to build an artificial tree.
SCHOOL European School of Brussels I, Belgium

LABORATORY
Nanobiotechnology Laboratory, Nanobiotech

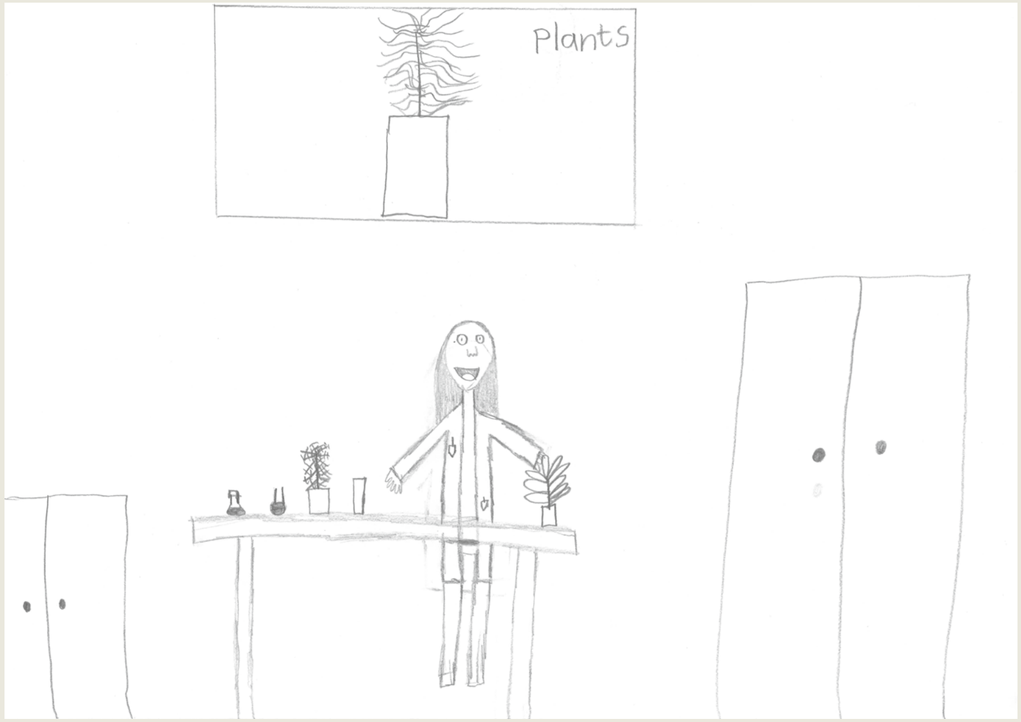
PORTFOLIO
2 – Energy solutions, 10 – Healthy biodiversity



My lab studies plants. How they grow, whether you can make them growing faster or what they do, when they get more oxygen and much more.
SCHOOL European School of Brussels I, Belgium

LABORATORY
Environmental biotechnology laboratory, EBL

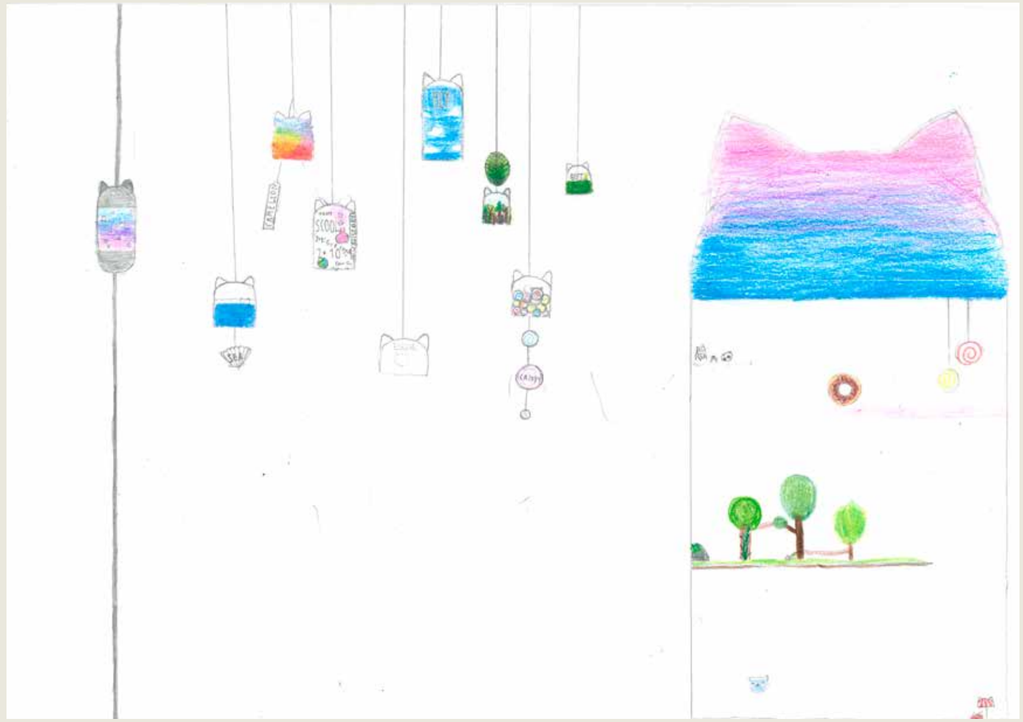
PORTFOLIO
10 – Healthy biodiversity



We don't know so many plants that we can eat so it would be good if we know more.
SCHOOL European School of Mol, Belgium

LABORATORY
Nanobiotechnology Laboratory, Nanobiotech

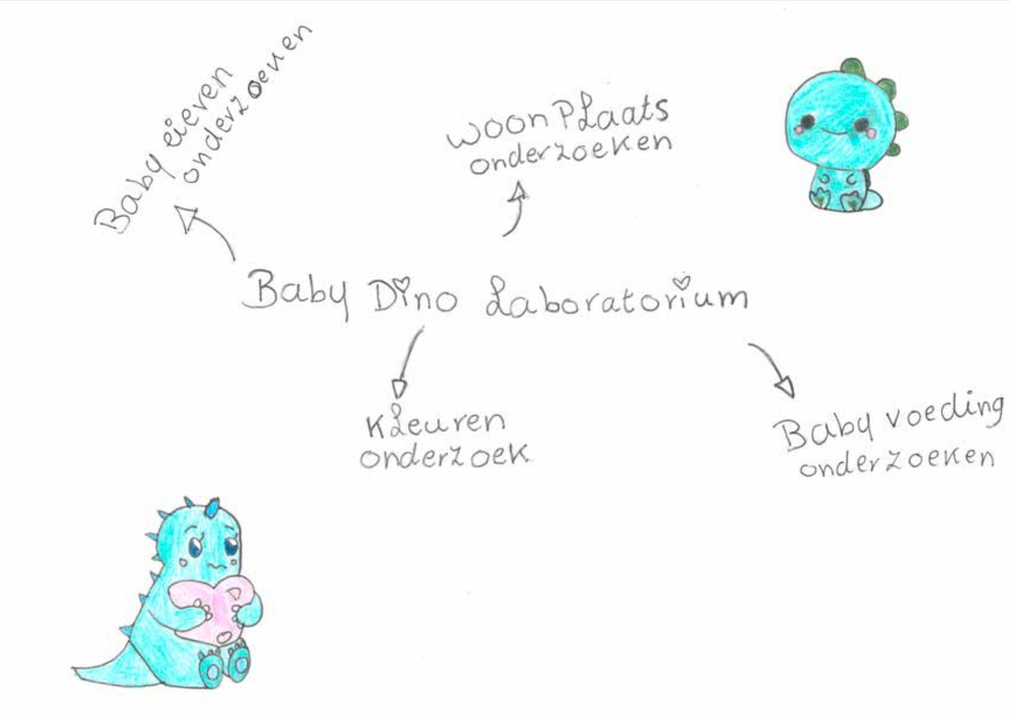
PORTFOLIO
11 – Sustainable food systems



Smolsie Laboratory. In the Smolsie laboratory, there are various smolsies, small fluffy, round animals with different characteristics. On the left, there is a liquid that brings animals to life. In the middle hang glass containers where smolsies are grown. To the right is an enclosure where the animals have everything they need. From there, you can adopt them.
SCHOOL European School of Brussels I, Belgium

LABORATORY
Nanobiotechnology Laboratory, Nanobiotech

PORTFOLIO
10 – Healthy biodiversity



"baby egg research", "hometown research", "Baby Dino Laboratory", "color research", "baby food research"
SCHOOL European School of Mol, Belgium

LABORATORY
Food Contact Materials Laboratory, FCM

PORTFOLIO
10 – Healthy biodiversity

CHAPTER 2

A EUROPE FIT FOR THE DIGITAL AGE

The projects under this priority aim to ensure a smooth transformation to a digital technology world, while being fair and climate neutral. Europe is intended to have digital sovereignty and set standards instead of depending on others. Examples of such initiatives are protecting Europeans from online threats, computer chips, safe artificial intelligence, climate neutrality in industry, and space, including safe satellite-based connectivity systems and the management of space traffic. The JRC has portfolios that work on digital transition, trustworthy AI, cybersecurity, data for science and policy, Earth observation, and global satellite navigation (i.e. Galileo).

At the JRC, researchers are also working on promoting the digital transition at different levels. The JRC has various laboratories covering the topic of digital transition. Some are focussed on travel and infrastructure, like the Electronic travel documents conformity laboratory, the Digital tachograph laboratory, the Smart Grid interoperability laboratory, and the Vehicle emissions laboratories. Others work on radio waves, satellites and earth observation, like the Experimental platform for internet contingencies & blockchain technologies, the Open space laboratory, the Radio spectrum laboratory, and the European microwave signature laboratory and EU GNSS simulation and receiver testing facilities. Lastly, multiple research infrastructures work on the intersection of digital and biological fields, such as the Biometrics laboratory, the Nanobiotechnology laboratory, and the Genetically modified organisms laboratory.

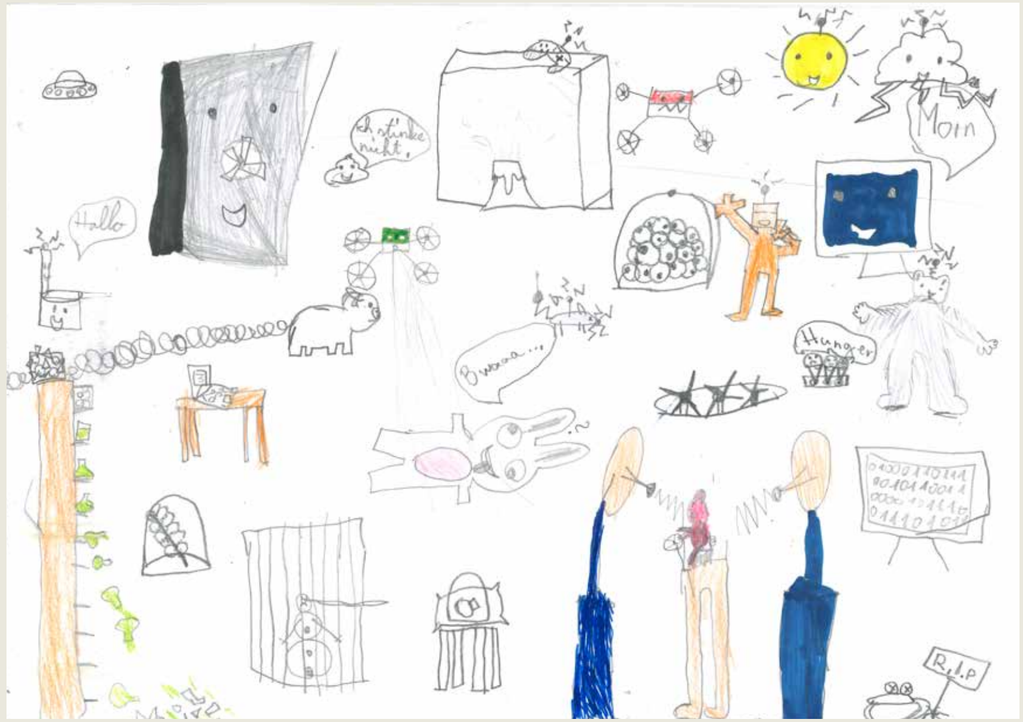
In the view of the children, digitalisation is not seen as a goal itself. Digitalisation is rather displayed as a means to improve existing processes or provide solutions to current and future problems. For instance, to make mobility more efficient, some of the creative ideas proposed by the children were teleportation devices (“destroys and rebuilds particles”), dimension hop machines, flying chairs, and smart portals. Communication could be upgraded with the use of holograms and 3D calls “to see them in person” and clothing can be altered with smart coats that predict and adapt to the weather or smart cupboards that create the clothes you desire. Larger issues, which the schoolchildren portray in their drawings and would like scientists to solve with digital solutions are the destruction of the ozone layer, with one drawing stating “[the ozone layer] is being destroyed from all the sprays and the cars” and the excess of waste that could be put in an artificial black hole.

Many drawings contained robots and robotics, a theme which caught the interest of many children. These robots are displayed as being part of the daily life or working in the laboratories. One drawing contains multiple robots who have exploded or otherwise broken down as a consequence of their lab work. Whether they are the classic humanoid machines that walk

around and do things or upgraded appliances such as piggy banks, suitcases and toilet bowls, the future of science is clearly linked to robots in the minds of children.

A last theme that captures the imagination of children is outer space. As mentioned previously, many children are worried about the future of the Earth and fear it will become inhabitable. To find alternatives, they show scientists exploring space and other planets, in particular Mars. Some drawings also portray the potential living alternatives in our own planet, for instance in the oceans. The creativity of the children covers ideas such as planets where it rains diamonds, magnetic field islands, or domes with supplies on Mars.

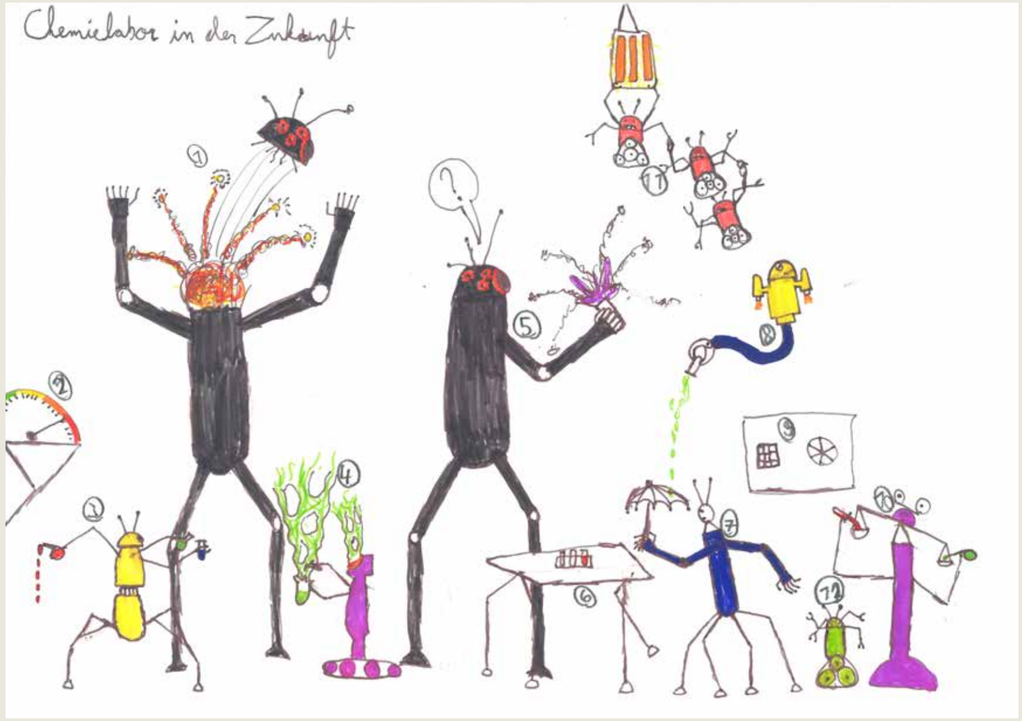
The JRC and the European Commission are currently doing work on many of the ideas the children have offered, while some are still at a very early stage, as the example of establishing a presence on Mars. An example from the JRC Ispra site is the self-driving robot Yape, which can deliver recycled office supplies to the staff at the site. This robot was tested at one of the JRC laboratories by scientists from the European Commission. The drawings from the children and their innovative ideas can inspire the scientists to conduct research in new digital technologies and solutions for our world.



A sparrow pig that gets angry when you step on a tail, "This is a TV that understands you and talks to you", "This is a talking toilet that can get longer, colder and smells good", "Hello, I was expecting you", "A drone that can teleport things/living beings", "A ring that makes you as small as a mouse", "An ice cream that was always hungry. But the problem is that they always eat each other.", "A beam that can transform things.
SCHOOL European School of Brussels I, Belgium

LABORATORY
Smart Infrastructures Living Lab, MITICA+
Future Mobility Solutions Lab, FMS-Lab

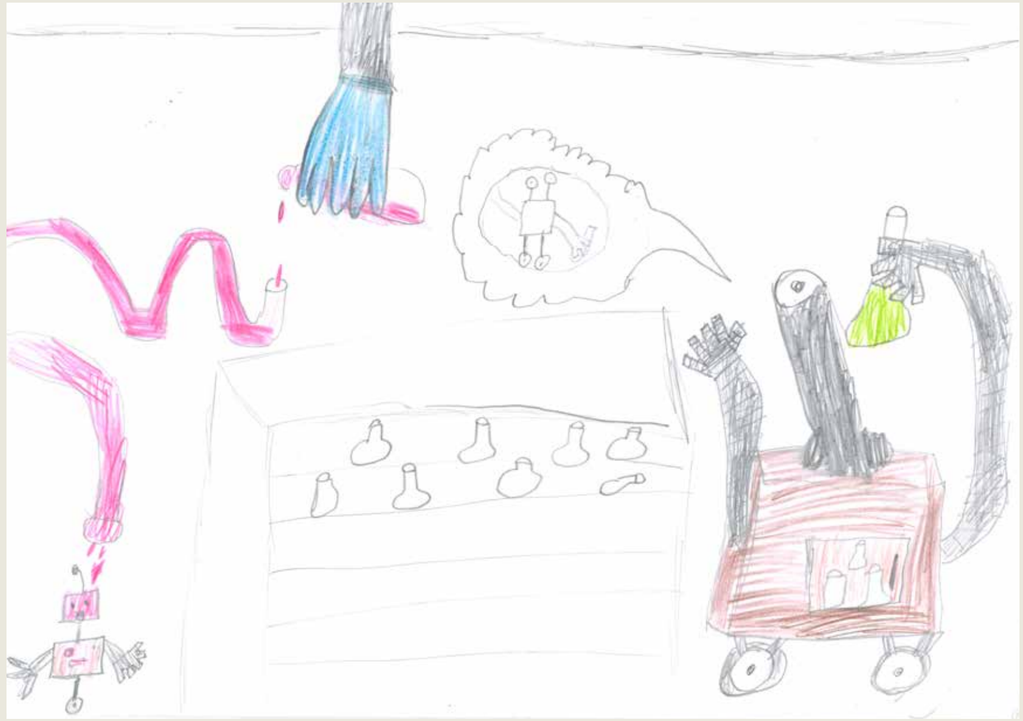
PORTFOLIO
14 – Digital transition, 15 – Trustworhy AI



1. Robot of the series: Max RR whose head explodes. 2. Alarm system: Orange-red. 3. Golden X Series Robot turbo 1.
4. Robot that exploded while mixing liquids. 5. Max RR series robot wondering why his misetures are exploding. 6. Running table that fieht.
7. Robot that runs after the table and protects itself from acidity. 8. Flying robot tilting Süure on robot No. 7. 9. Safe. 10. Scale robot.
*11. Garbage robots hanging from the lamp. 12. Garbage robots. * Max RR = Maximum Giant Robot.*
SCHOOL European School of Brussels I, Belgium

LABORATORY
Water Laboratory, WaterLab
Unmanned Aircraft Systems Lab, C-UAS

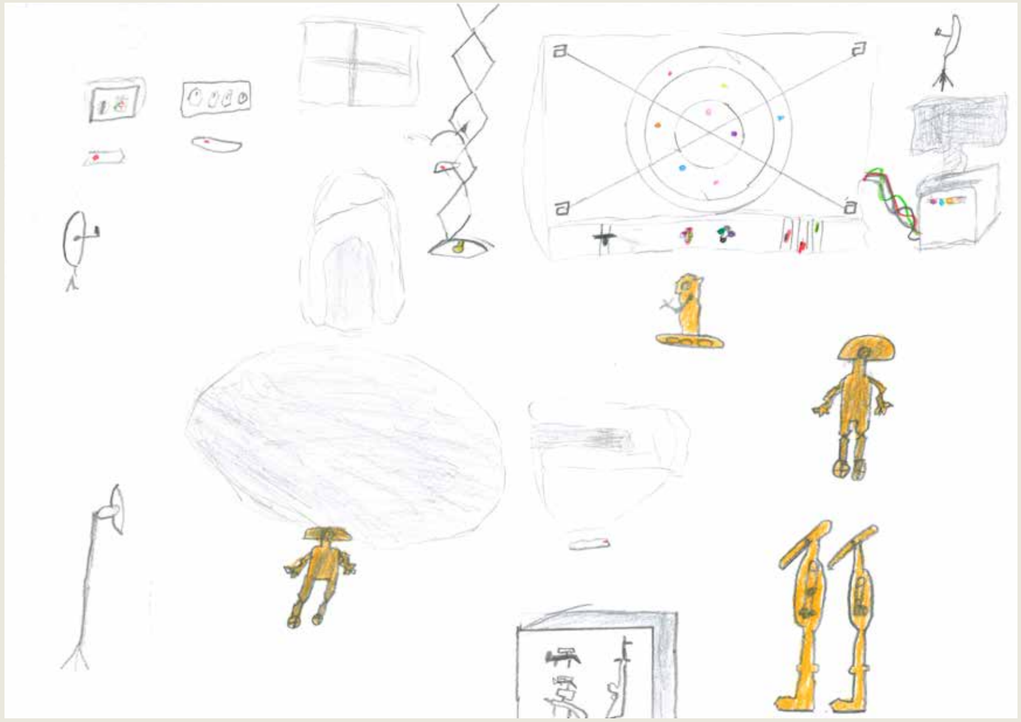
PORTFOLIO
9 – Zero pollution, 15 – Trustworthy AI, 30 – Science for security



The hand that you see putting liquid in the tube for the little robot to make it bigger.
The big robot washes the used batches and thinks about making another robot.
SCHOOL European School of Mol, Belgium

LABORATORY
EU Reference Laboratory for AlterCnatives to Animal Testing , EURL ECVAM
Experimental Platform for Internet Contingencies & Blockchain Technologies, EPIC

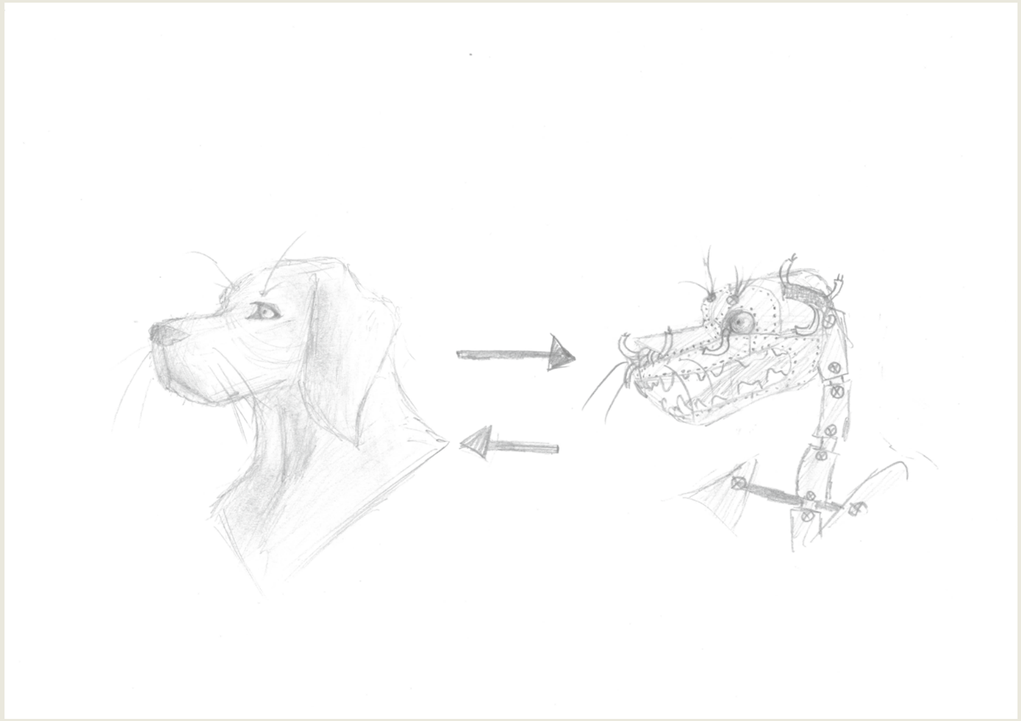
PORTFOLIO
15 – Trustworthy AI



The Xrade room is only controlled by RyyR robots, but also by three humans who steer manually.
SCHOOL European School of Brussels I, Belgium

LABORATORY
T2 Open Space Laboratory, T2 Openlab

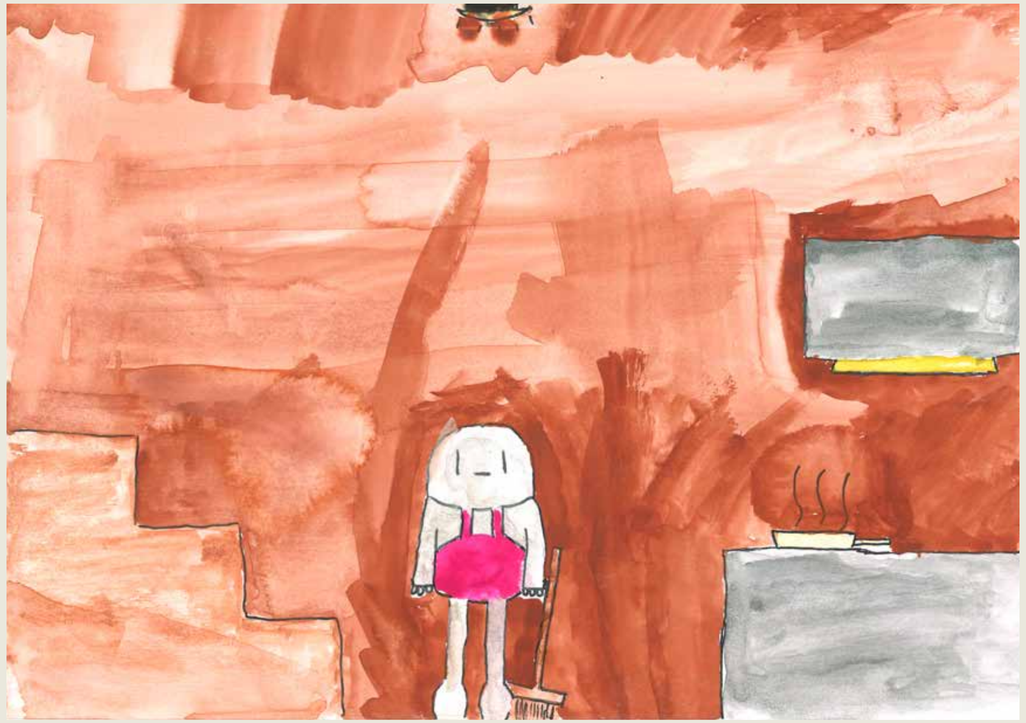
PORTFOLIO
14 – Digital transition, 15 – Trustworthy AI, 16 – Cybersecurity



This is a robot replica of a pet that has passed away.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Unmanned Aircraft Systems Lab, C-UAS

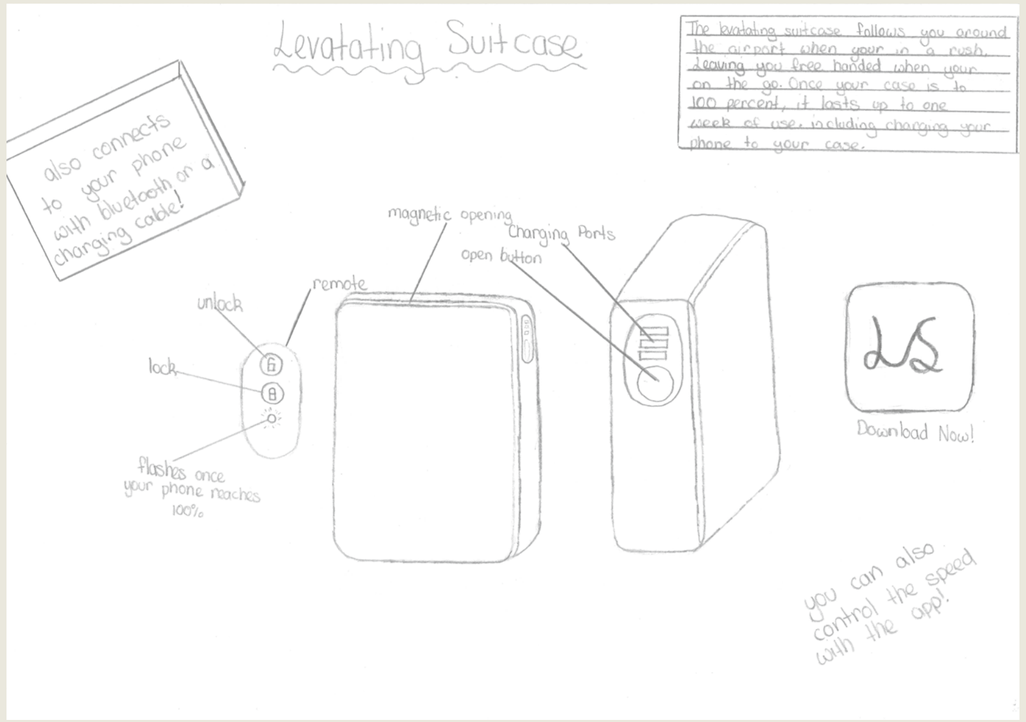
PORTFOLIO
15 – Trustworthy AI, 20 – Inclusive and resilient society, 28 – Life and health sciences



My invention is a robot that does boring, everyday things for you like: chores (cooking, cleaning). I would make that everyone would be able to obtain one by making them very cheap. If you were wondering, no they will not take over the world.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
T2 Open Space Laboratory, T2 Openlab

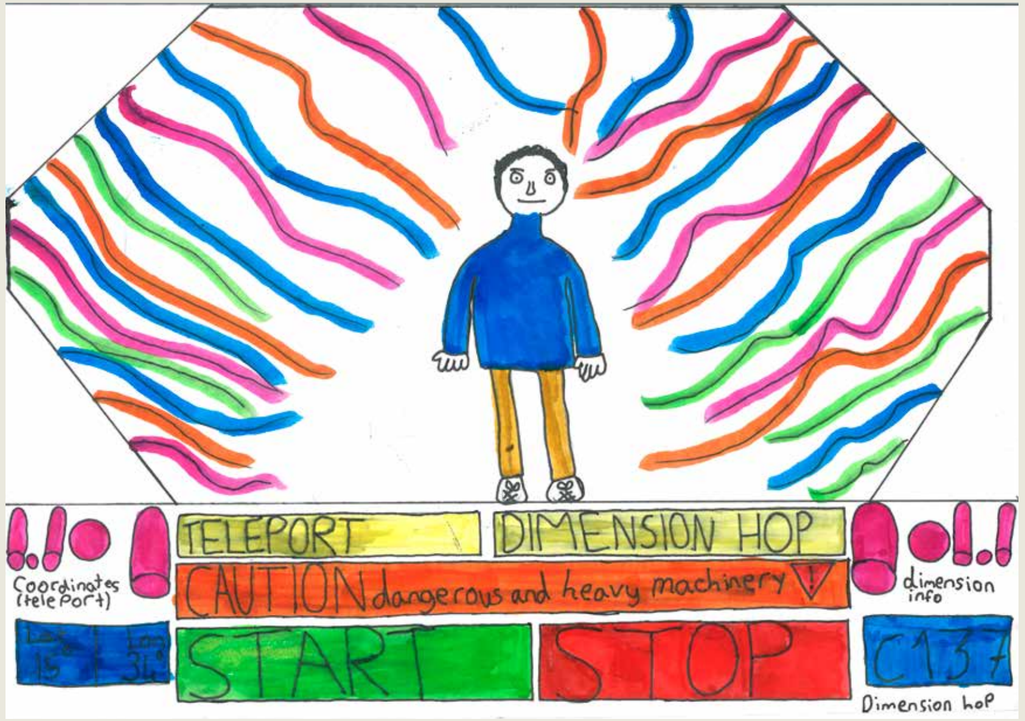
PORTFOLIO
15 – Trustworthy AI



The levitating suitcase follows you around the airport when you're in a rush. Leaving you free handed when you're on the go. Once your case is to 100 percent, it lasts up to one week of use, including charging your phone to your case.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Border Security Research Infrastructure, Border Security RI
Future Mobility Solutions Lab, FMS-Lab

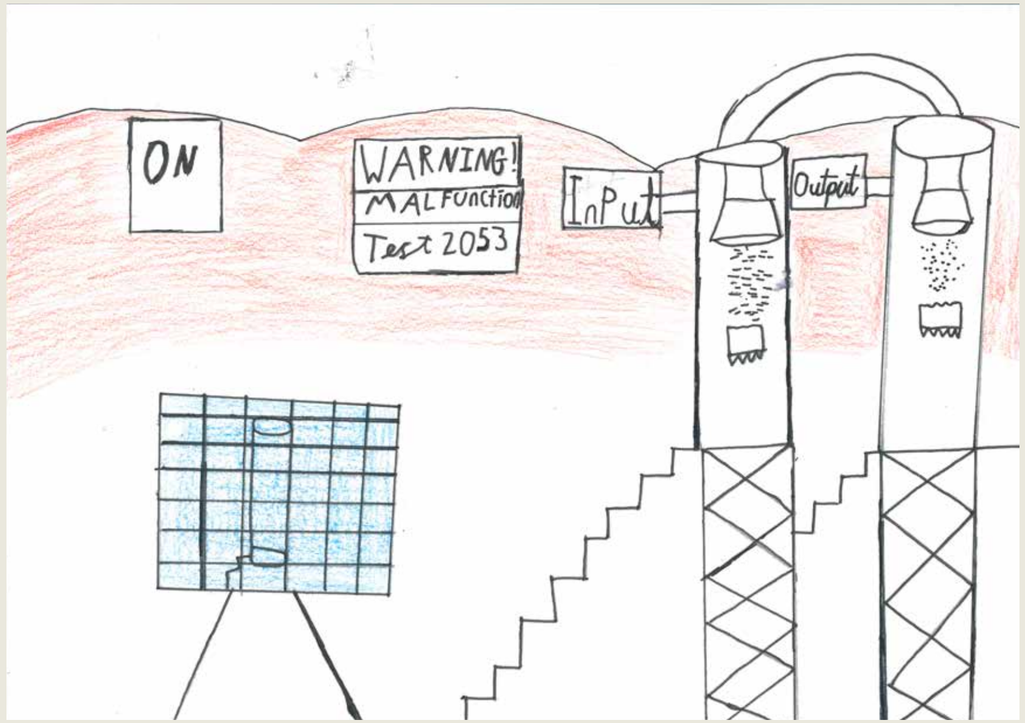
PORTFOLIO
14 – Digital transition, 19 – Galileo



This is a device that can teleport or dimension hop anything or anyone. From the push of a button.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS
Future Mobility Solutions Lab, FMS-Lab

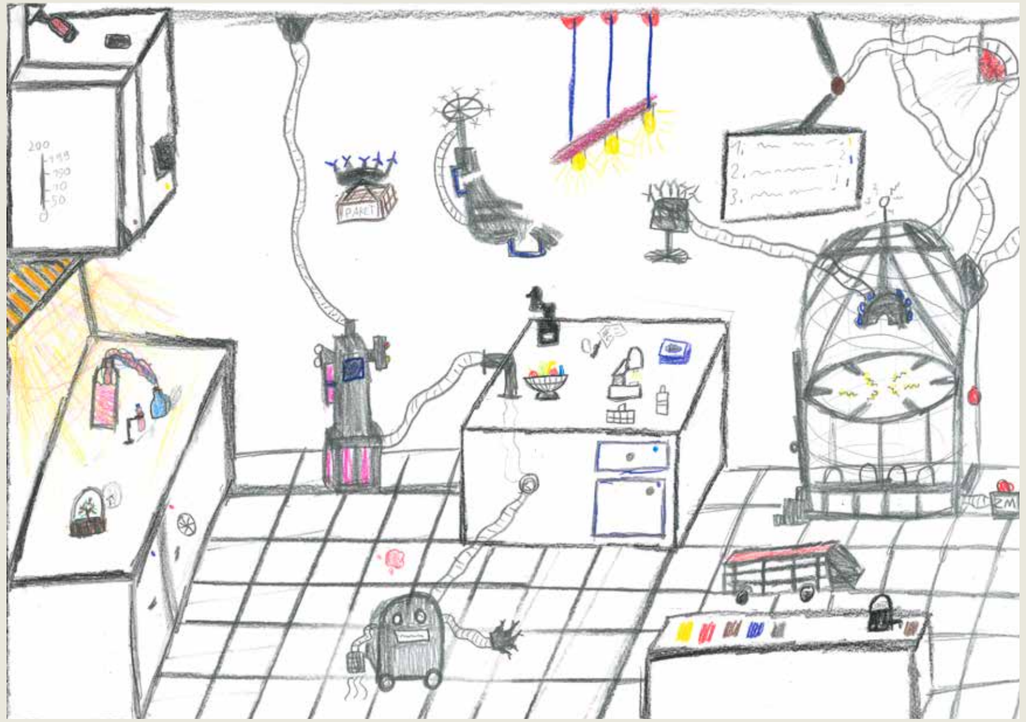
PORTFOLIO
6 – Mobility, 14 – Digital transition, 19 – Galileo



Teleportation Device. Destroys and rebuilds particles.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS
Future Mobility Solutions Lab, FMS-Lab

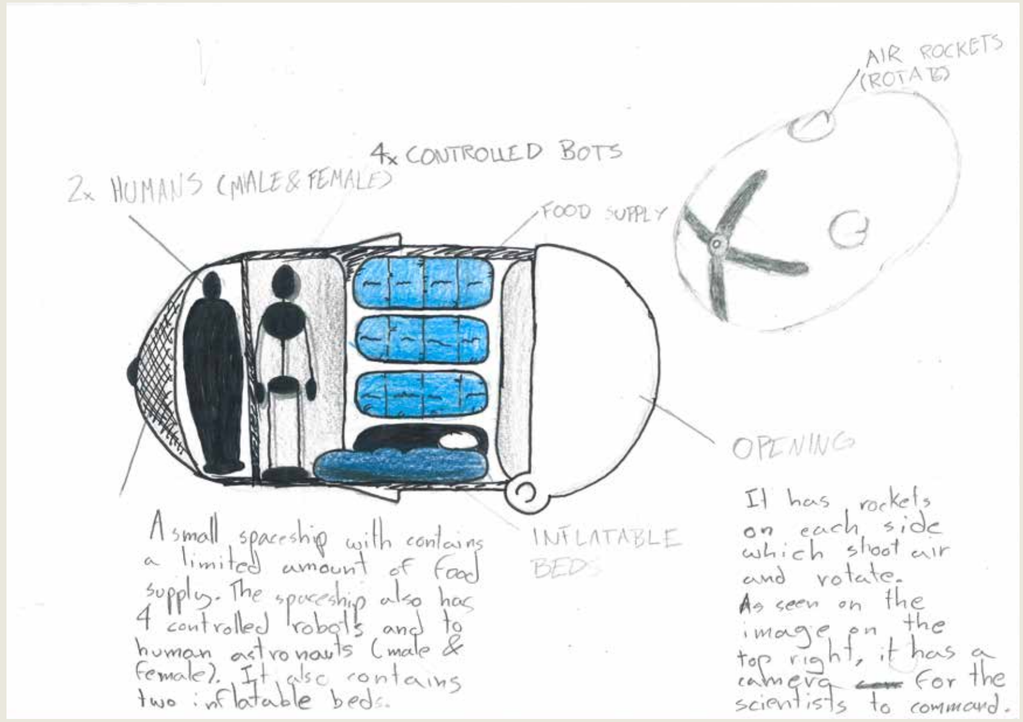
PORTFOLIO
6 – Mobility, 14 – Digital transition, 19 – Galileo



In my ∞ lab, you can go back in time or fly around with flying chairs. (With very soft pimping.) A robot sweeps up the toxic and mixed liquids. Drones hold parcels and of course what should not be missing: A coffee machine! (bottom right)
SCHOOL European School of Brussels I, Belgium

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS
Future Mobility Solutions Lab, FMS-Lab

PORTFOLIO
6 – Mobility, 9 – Zero pollution, 14 – Digital transition, 19 – Galileo



A small spaceship with contains a limited amount of food supply. The spaceship also has 4 controlled robots and to human astronauts (male&female). It also contains two inflatable beds.", "It has rockets on each side which shoot air and rotate. As seen on the image on the top right, it has a camera for the scientists to command.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Border Security Research Infrastructure, Border Security RI

PORTFOLIO
19 – Galileo

Portal in smart world
SCHOOL European School of Bergen, the Netherlands

LABORATORY
SMART GRID Interoperability Laboratory, SGILAB
Vehicle Laboratory - European Interoperability Centre and Advanced Vehicle Testing, VELA-EIC&AVT

PORTFOLIO
6 – Mobility, 7 – Cities and buildings, 19 – Galileo

I will like to make every cable or charge go by wi-fi but a wi-fi that isn't unhealthy so that we reduce plastic in cables.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
SMART GRID Interoperability Laboratory, SGILAB
Vehicle Laboratory - European Interoperability Centre and Advanced Vehicle Testing, VELA-EIC&AVT

PORTFOLIO
2 – Energy solutions, 6 – Mobility, 9 – Zero pollution, 19 – Galileo, 28 – Life and health sciences

My invention is a bracelet and when you press the button a hologram will show up.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
T2 Open Space Laboratory, T2 Openlab

PORTFOLIO
14 – Digital transition, 16 – Cybersecurity

3D calls, to see them in person.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
T2 Open Space Laboratory, T2 Openlab

PORTFOLIO
14 – Digital transition

The Ozone Layer. The ozone layer is being destroyed from all the sprays and the cars. Scientist have to focus on saving it. It keeps the bad sun rays out of the atmosphere and only lets the good ones pass in.
SCHOOL European School of Mol, Belgium

LABORATORY
European Commission Atmospheric Observatory, EC AtmO

PORTFOLIO
8 – Climate neutrality, 9 – Zero pollution, 18 – Earth oberservation

This W.V. can show the weather. W.V. stands for weather vest. In the morning it will tell you the weather for the afternoon, the afternoon for the evening and evening for the morning. This will help because you won't need your phone to see the weather.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Nanobiotechnology Laboratory, Nanobiotech

PORTFOLIO
14 – Digital transition, 18 – Earth oberservation

My idea is scientists should be working on exploring the ocean because only 0.4% has been explored.
SCHOOL European School of Mol, Belgium

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS

PORTFOLIO
10 – Healthy biodiversity, 18 – Earth oberservation

Alienontdeklab.
SCHOOL European School of Mol, Belgium

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS

PORTFOLIO
20 – Inclusive and resilient society

Black hole exploration. Go very fast through the black hole or have a very resistant material but strong enough to survive space and make a spaceship out of it or make a camera out of it and send it in to a black hole.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS

PORTFOLIO
12 – Sustainable materials, 19 – Galileo

I think that extracting diamond from a place where it rains diamonds would be cool.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS

PORTFOLIO
19 – Galileo

We could create an artificial black hole. This could save our planet! Instead of burning our waste and releasing greenhouse gases, we can throw our waste into this black hole. The hole can be controllable and obviously not as strong as other black holes this could lead to disaster. However I believe with the right resources and monitoring we can create a black hole that will save our planet!
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Commission Atmospheric Observatory, EC AtmO
Greenhouse Gas Flux measurement Tower, IT-SR2

PORTFOLIO
9 – Zero pollution, 18 – Earth oberservation, 19 – Galileo

Life on Mars.
SCHOOL European School of Bergen, the Netherlands

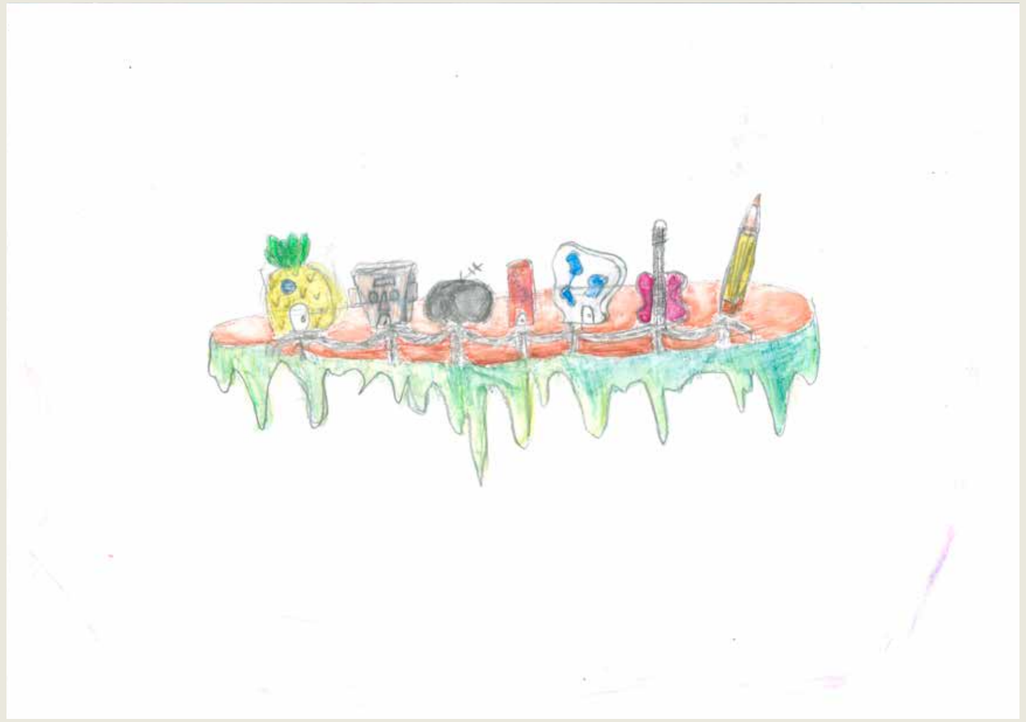
LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS

PORTFOLIO
19 – Galileo

This is Mars and on Mars it has a dome on top and that is where all of the plants and supplies are in. Then they take it to Earth.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS

PORTFOLIO
19 – Galileo



My invention is a floating island. How it works? There are magnets on the island (and the islands magnets are big by the way) and the surface of Earth there are also magnets and they are pushing the island away since they are both negatively charged. This can help people when they want privacy and we also have more land.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Laboratory for Structural Assessment: Large Hopkinson Bar facility, ELSA – HopLab
European Laboratory for Structural Assessment: Reaction Wall facility, ELSA - Reaction Wall

PORTFOLIO
7 – Cities and buildings, 8 – Climate neutrality, 12 - Sustainable materials

CHAPTER 3

AN ECONOMY THAT WORKS FOR PEOPLE

The goal of making a economy that works for people is to make both individuals and companies in the European Union thrive. For this purpose, the European Commission invests in the recovery from the COVID-19 pandemic, ensuring that workers receive a good minimum wage and work in good conditions, giving people the chance to learn new skills. The JRC contributes to this with research on making an inclusive and resilient society, economic governance, territorial intelligence, education, skills and jobs, and risks and opportunities for the future.

The JRC has various research infrastructures that work on this priority. The European Crisis Management Laboratory combines various projects across the JRC that can be used for early warnings, impact assessment and risk anticipation. Two other laboratories, the European Laboratory for Structural Assessment: Large Hopkinson Bar Facility and the European Laboratory for Structural Assessment: Reaction Wall Facility, tests the strength of building materials, for example in the case of earthquakes or other impacts. In the drawings, some of the children showed concerns in line with this priority. For example, making the chores robot cheap and available at all levels of society so "everyone would be able to obtain one". Economic opportunities for businesses do appear secondary to the children. Still, some of them have great ideas for new products that could be brought on the market: from laser lipsticks to levitating suitcases.

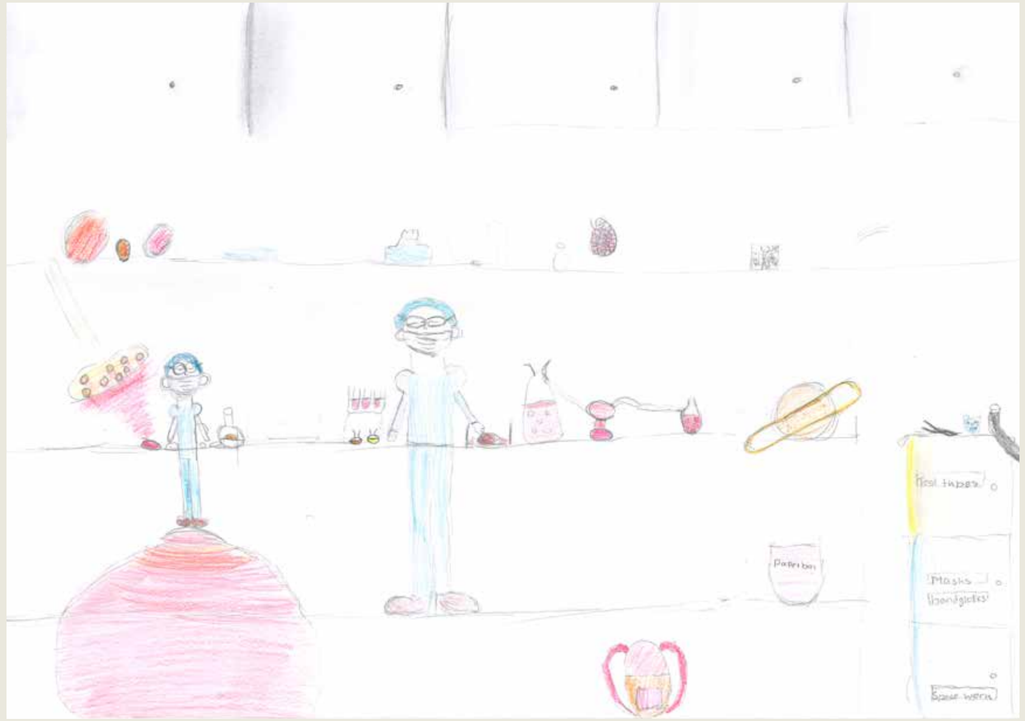
Children do show great concern about future risks. In this chapter, you will find multiple drawings containing descriptions such as "Earth will die and then humans will be extinct" and "If the Earth dies". As a response to this potential future, the children propose that scientists explore the planets in our solar system and establish a presence on Mars, for example in a dome. They recognise that we often lack information to deal with upcoming crises and therefore draw scientists that explore black holes and the oceans or study the properties of plants and stones from outer space. And some young artists warn us of risks that no JRC scientist has yet been aware of, such as the "killer butterflies".

Children prioritise a workable people's economy differently than adults do. They exprss a wish for social equality, but do not connect this to research infrastructures. The JRC also does not link many experiments in its research infrastructures to social economy, although JRC teams work with surveys on specific research topics in the European society. As the topic is of great importance to the children, the JRC dedicates efforts using its "living labs" approach to enhance research in this topic, as it includes risks and opportunities of a social economy in the future.

Future research lab. My poster is about scientists researching about other galaxys and solar systems, so that if the Earth dies, we have somewhere to flee, and keep on living.
SCHOOL European School of Mol, Belgium

LABORATORY
Properties of Actinide Materials under Extreme Conditions , PAMEC
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS
T2 Open Space Laboratory, T2 Openlab

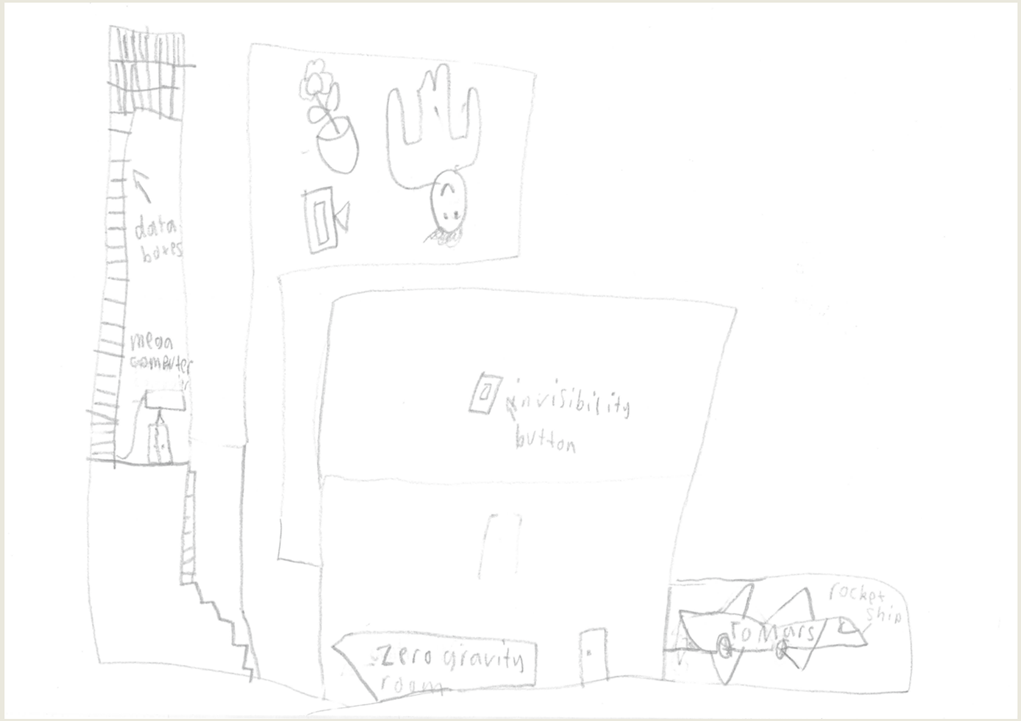
PORTFOLIO
19 – Galileo, 26 – Future risks & opportunities



Space Future Research. I think we should research on planets because Earth will die and then humans will be extinct. And we should look for other plants in our solar system.
SCHOOL European School of Mol, Belgium

LABORATORY
Properties of Actinide Materials under Extreme Conditions , PAMEC
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS
T2 Open Space Laboratory, T2 Openlab

PORTFOLIO
19 – Galileo, 26 – Future risks & opportunities



I drew a laboratory and I wanted scientists to focus on getting on Mars so if Earth dies we can go there.
SCHOOL European School of Mol, Belgium

LABORATORY
Properties of Actinide Materials under Extreme Conditions , PAMEC
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS
T2 Open Space Laboratory, T2 Openlab

PORTFOLIO
19 – Galileo, 26 – Future risks & opportunities

Problem: People do not know much about stones from outer space so it would be great to know what kind of stones there are..
SCHOOL European School of Mol, Belgium

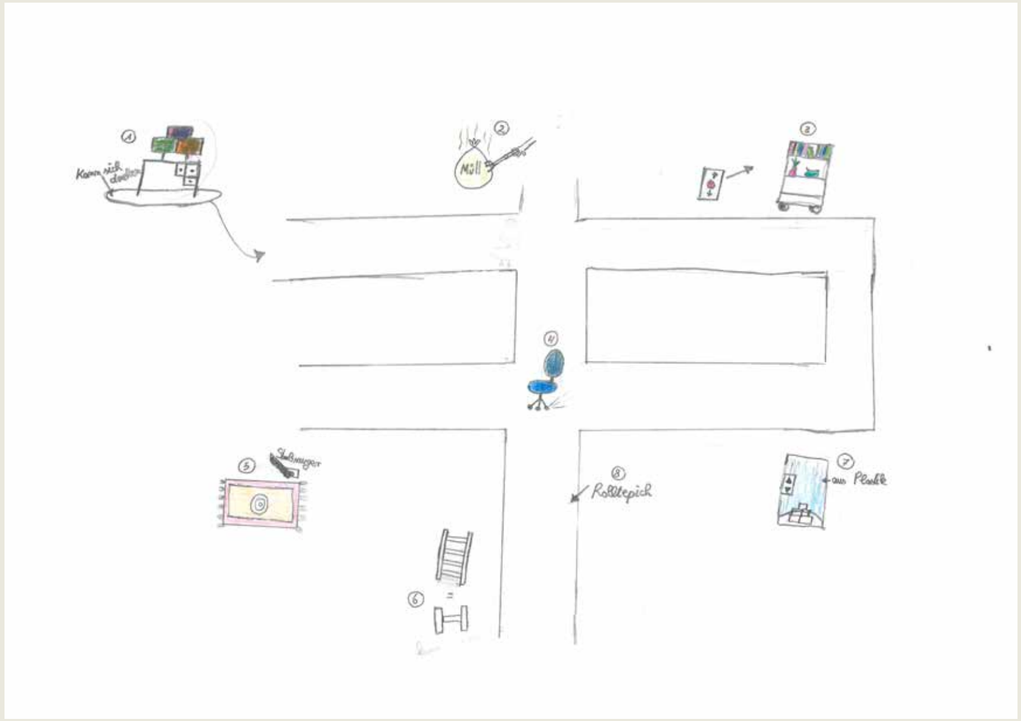
LABORATORY
Properties of Actinide Materials under Extreme Conditions , PAMEC
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS
T2 Open Space Laboratory, T2 Openlab

PORTFOLIO
19 – Galileo, 21 – Education, skills and jobs, 26 – Future risks & opportunities

Research of the killer Butterflies! Biograph. Life span: 4-6 years. Color - blue or purple.
SCHOOL European School of Mol, Belgium

LABORATORY
Environmental biotechnology laboratory (EBL)

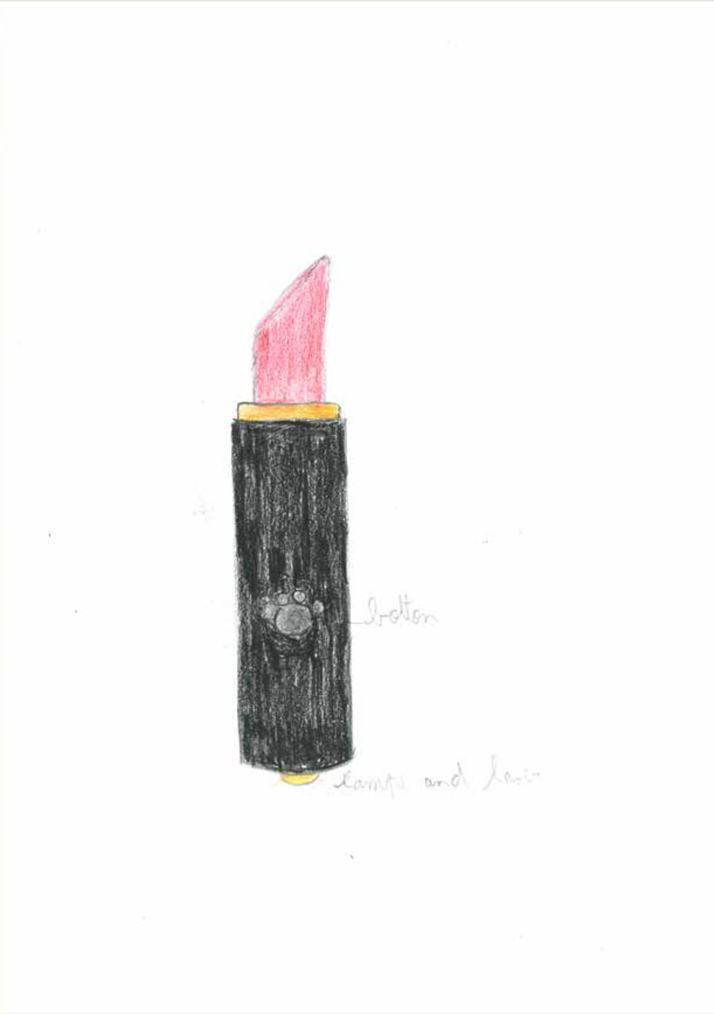
PORTFOLIO
10 – Healthy biodiversity, 25 – Crises management, 26 – Future risks & opportunities, 27 – Health crises responses



1. You can rotate that, then there's something else on the other side.
2. An artificial hand that can take the garbage or something else. Can also be extended.
3. Remote control that pushes and moves the rolling cabinet.
4. A wheeled chair with a drive when you don't feel like moving.
5. When a carpet is fully cooked, the small stagger can clean it automatically.
6. A mini ladder to carry around that can also be extended.
7. A plastic elevator also in the home available.
8. A roll pick that can be used anywhere.
SCHOOL European School of Brussels I, Belgium

LABORATORY
SMART GRID Interoperability Laboratory, SGILab
Smart Infrastructures Living Lab, MITICA+

PORTFOLIO
9 – Zero pollution, 15 – Trustworthy AI, 26 – Future risks & opportunities, 27 – Health crises responses, 28 – Life and health sciences



Lipstick is special, when you press on the cat paw, the lamp turns on and they get lasered.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Advanced Safeguards Measurement, Monitoring and Modelling Laboratory, AS3ML
Fuels and Materials Research, FMR

PORTFOLIO
5 – Small modular reactors, 14 – Digital transition, 26 – Future risks & opportunities, 30 – Science for security

CHAPTER 4

PROMOTING OUR EUROPEAN WAY OF LIFE

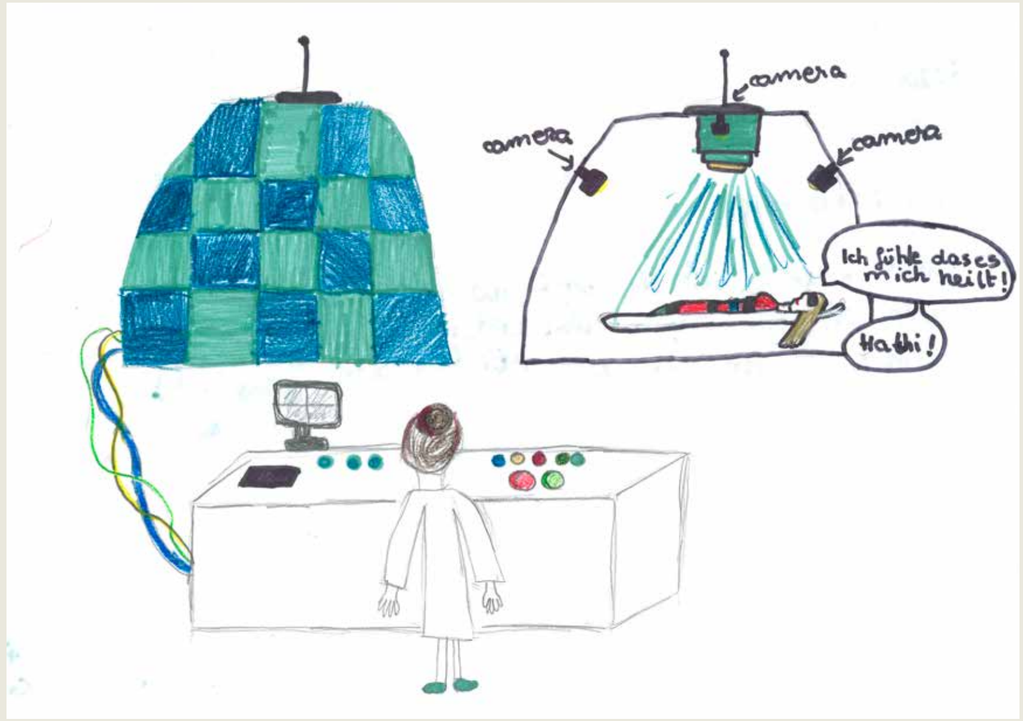
Central to this priority are the EU's core values of human dignity, freedom, democracy, equality, rule of law and human rights. Under the umbrella of promoting our European way of life, one finds health-related initiatives such as the Beating Cancer Plan, but also the free travel between countries of the Schengen Area, migration management and efforts to ensure security and tackle crime. Within the JRC, cross-disciplinary teams are working on crisis management, health crises response, life and health sciences, cancer and non-communicable diseases, science for security, nuclear compliance assurance, and population dynamics and migration.

The JRC has various research infrastructures that contribute to this priority. In health, there are on the one hand laboratories that study the safety and suitability of materials in our daily lives, such as the Narcotics laboratory, the Tobacco laboratory, the Food safety & compliance laboratory, the Genetically Modified Organisms laboratory, the Nanobiotechnology laboratory, and the Water laboratory. On the other hand, there are research infrastructures that ensure the safety of energy solutions and nuclear power, like the Nuclear and Trace Analysis facility, the European Nuclear Security training centre, the Advanced Safeguards Measurement, Monitoring and Modelling laboratory, the Fuels and Materials Research laboratory, the Properties of Actinide Materials under Extreme Conditions laboratory, the Radionuclide Metrology laboratories, the Tandem Accelerator Based Fast Neutron Source, the JRC Neutron Time-of-Flight Facility, the Nuclear Reference Material and Measurement facility, and lastly the Ispra Nuclear Safeguards, Security and Standardisation laboratory.

Many of the drawings produced by the children are related to healthcare. They were created in the spring of 2022, when the COVID-19 pandemic was becoming endemic, and most lockdowns had ended in Europe. For more than two years, healthcare and disease prevention played a major role in the children's daily lives, and this can be seen in their artworks: multiple drawings mention vaccines or talk about bringing people back to life. The healthcare laboratories contain more machines and robots than the other laboratories the children drew. Multiple drawings contain inventions that will make daily life easier for people with disabilities: special shoes that help blind people navigating the streets, helmets to prevent head injuries in sport athletes, and levitating chairs that make it easier to transport people.

Next to making life better, the children showed an interest in things scientists could invent to make life easier. For example, there were proposals for invisibility devices and special glasses that work like a computer or that can project a hologram of one's thoughts. Others thought about what would make their daily lives easier, such as a self-correcting pen or a cupboard that can give you the exact clothes that you would like to wear.

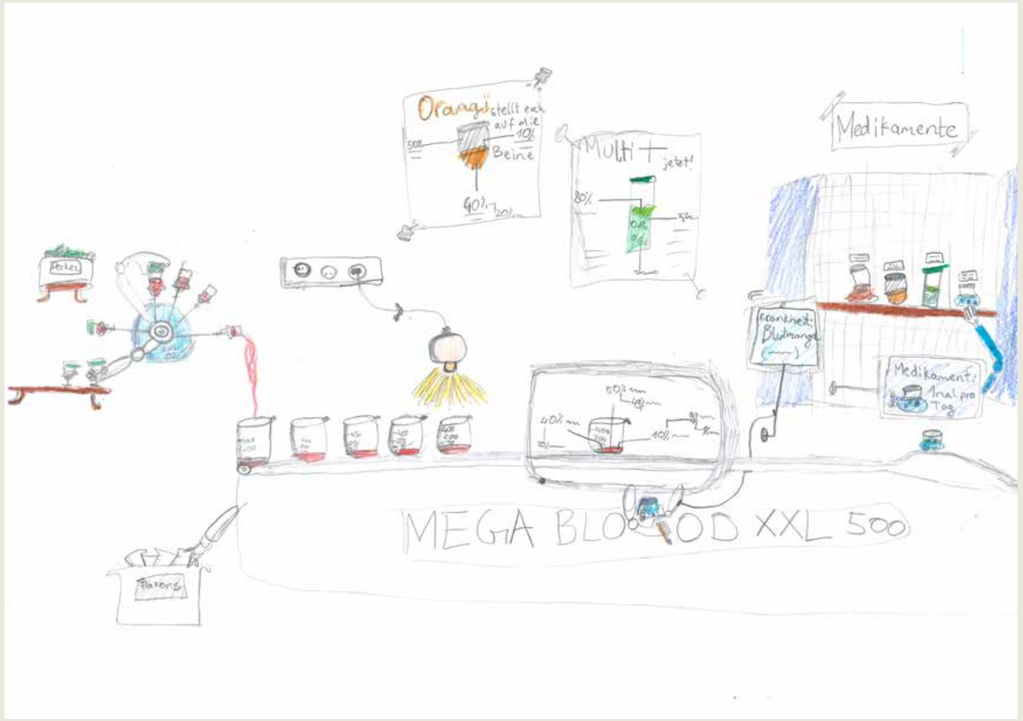
The children do not directly link their drawings to the "European way of life" priority of the current Commission, but take more the angle of improving life for humanity in general . However, when it comes to the specific goals of the Commission and the children, such as combatting diseases and preventing crises, they do align.



This capsule is a device where there is a floating bed on which sick people are placed and with the help of rays they are cured!
SCHOOL European School of Brussels I, Belgium

LABORATORY
Radionuclide Metrology laboratories, RADMET

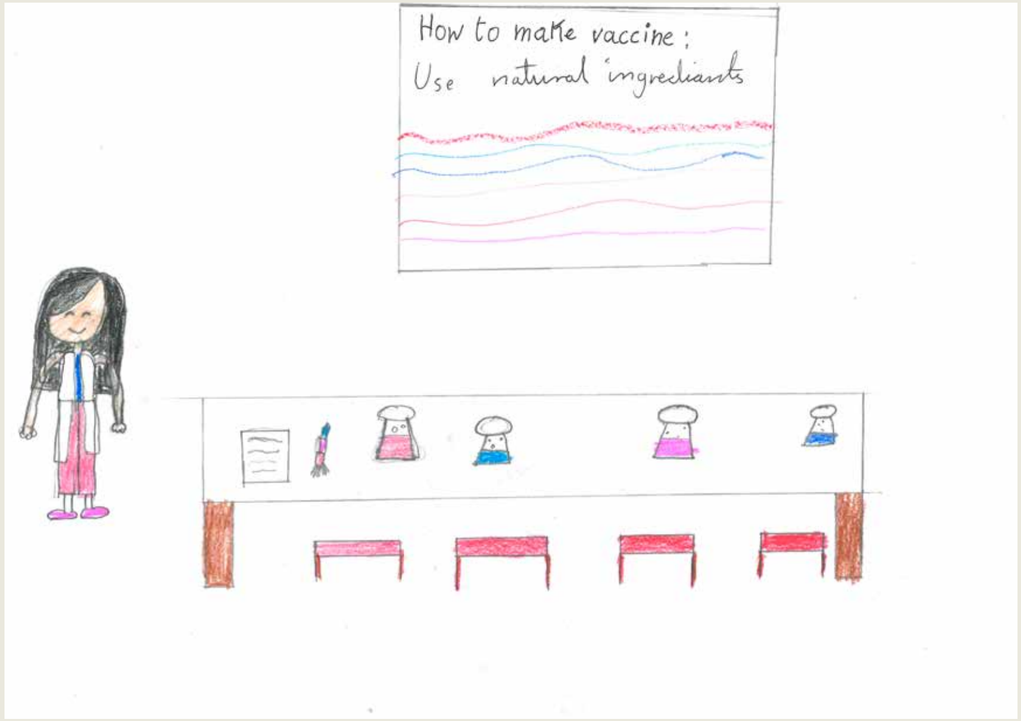
PORTFOLIO
28 – Life and health sciences, 29 – Cancer & non-comm. Diseases



The Knowledge Corner. My lab can independently measure blood from sick patients, and then tell what disease he (or she) has and decide the medication, what the patient needs and how many times a day or a week. The grippers help the machine to unscrew the lids and throw them into a box, for example, or to place the selected medication on a conveyor belt and it is delivered to the patient.
SCHOOL European School of Brussels I, Belgium

LABORATORY
Reference Materials Production Laboratory, RMPL

PORTFOLIO
28 – Life and health sciences



How to make vaccine: Use natural ingredients.
SCHOOL European School of Mol, Belgium

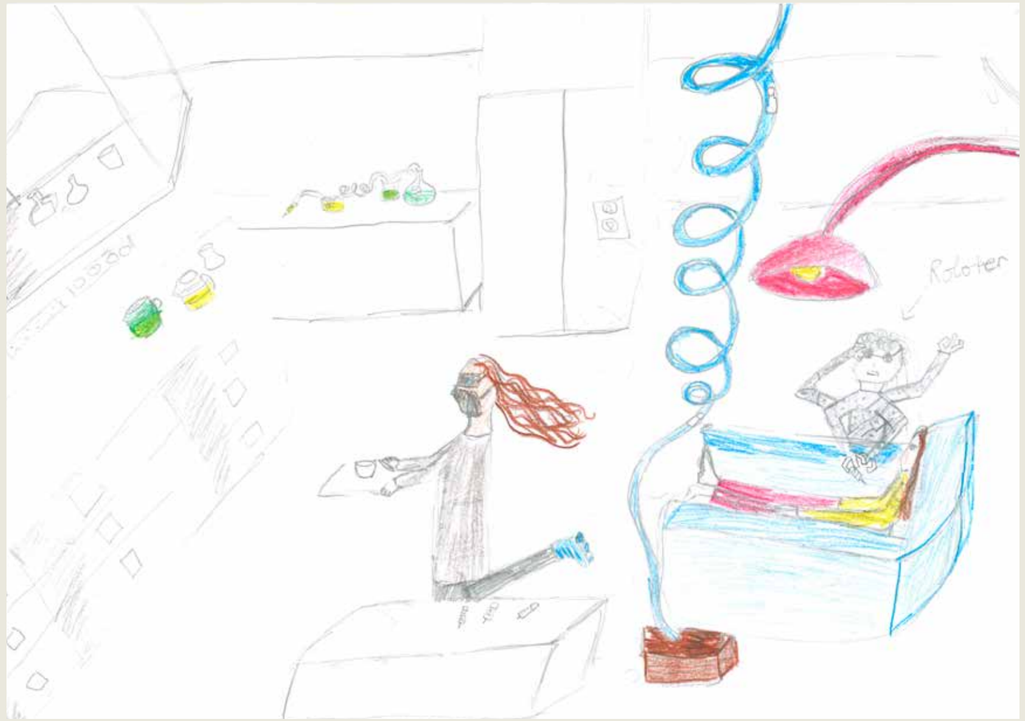
LABORATORY
Reference Materials Production Laboratory, RMPL

PORTFOLIO
27 – Health crises responses, 28 – Life and health sciences

This is a chemistry lab. The giant closet is for the acids, Meledalier and plants. The table with the chairs is for books and dosing. The individual ropes are windows. The two strokes for doors. There are people working there.
SCHOOL European School of Brussels I, Belgium

LABORATORY
Water Laboratory, WaterLab

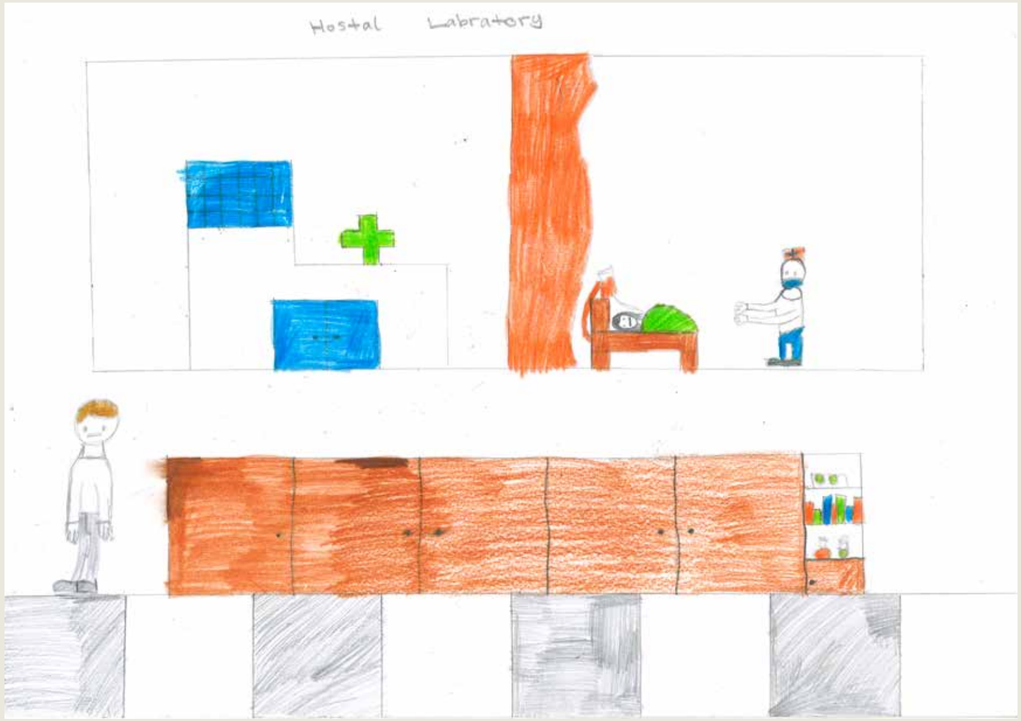
PORTFOLIO
9 – Zero pollution



A laboratory with different liquids and a powerful robot.
SCHOOL European School of Brussels I, Belgium

LABORATORY
European Crisis Management Laboratory, ECML

PORTFOLIO
14 – Digital transition, 15 – trustworthy AI, 28 – Life and health sciences



A thing scientists should work on really hard, is making hospitals a safer place because people get sick almost every day so it's important that they have a safe place to go.
SCHOOL European School of Mol, Belgium

LABORATORY
European Crisis Management Laboratory, ECML

PORTFOLIO
27 – Health crises responses, 28 – Life and health sciences, 29 – Cancer & non-comm. Diseases

Children life rescue laboratory.
Info. Before (children) die they will be treated in a machine that saves lives.
The [scientists] have to find the right personalised medicine to safe them.
SCHOOL European School of Brussels I, Belgium

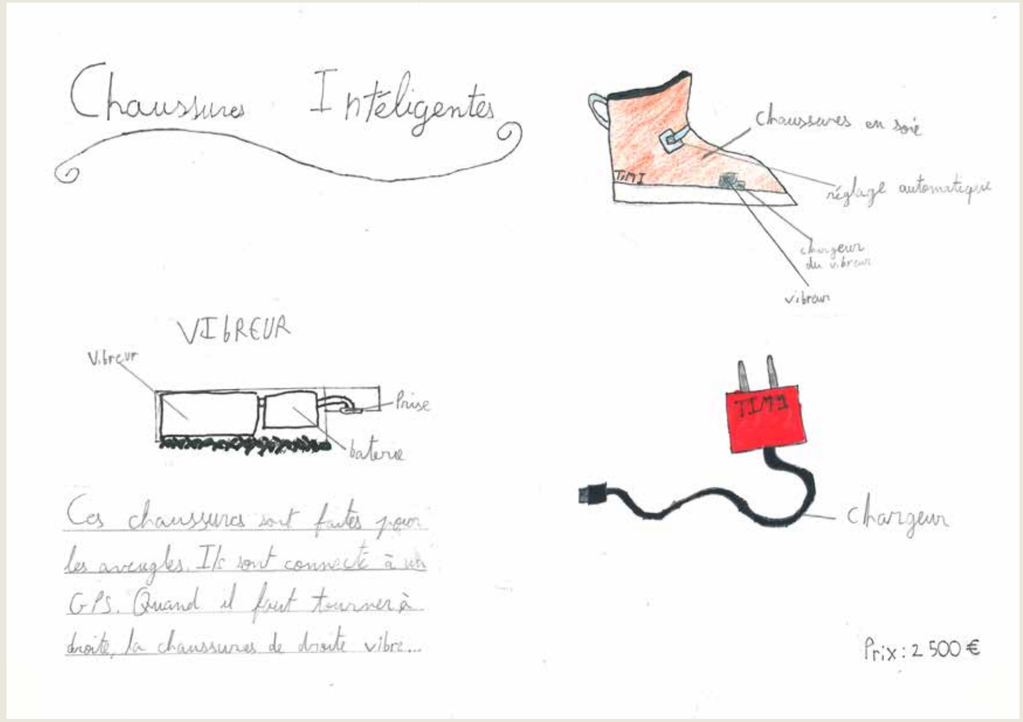
LABORATORY
European Crisis Management Laboratory, ECML
EU Reference Laboratory for Alternatives to Animal Testing, EURL ECVAM

PORTFOLIO
28 – Life and health sciences

Chemistry. The Chemistry Lab works to bring people to life.
SCHOOL European School of Brussels I, Belgium

LABORATORY
EU Reference Laboratory for Alternatives to Animal Testing , EURL ECVAM

PORTFOLIO
28 – Life and health sciences, 29 – Cancer & non-comm. Diseases



Intelligent shoes. These shoes are made for blind people. They are connected to a GPS. When you have to cross to the right, the right shoe vibrates.
SCHOOL European School of Bergen, the Netherlands

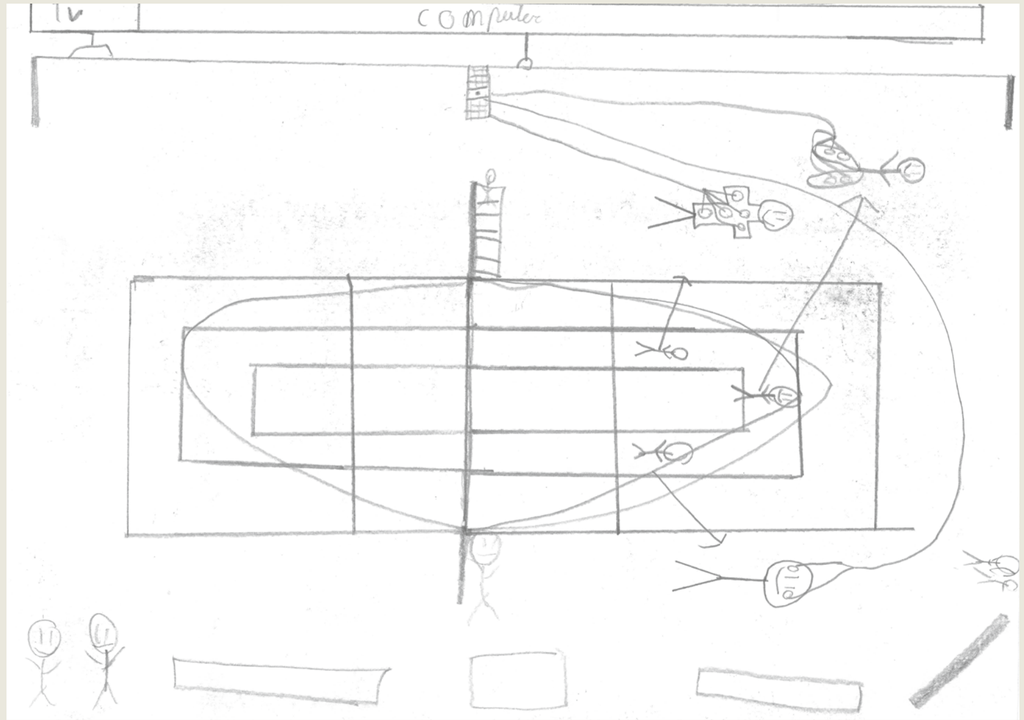
LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS

PORTFOLIO
14 – Digital transition, science for security, 19 – Galileo, 28 – Life and health sciences

My idea is to avoid a concussion while recycling plastic. My idea: to invent a helmet to protect football players from a concussion while letting them make heads. Then put the plastic football club logo on the front of the helmet. Here's my idea, I hope you'll take it.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Crisis Management Laboratory, ECML

PORTFOLIO
25 – Crises management, 28 – Life and health sciences



Physical research on volleyball. In this lab, research is carried out into what happens to your heart, brain and muscles. I want to know the difference between competitions and training. In your own team or in a foreign team. In addition, I want to investigate whether there are different effects of exercising for too long for your age.
SCHOOL European School of Mol, Belgium

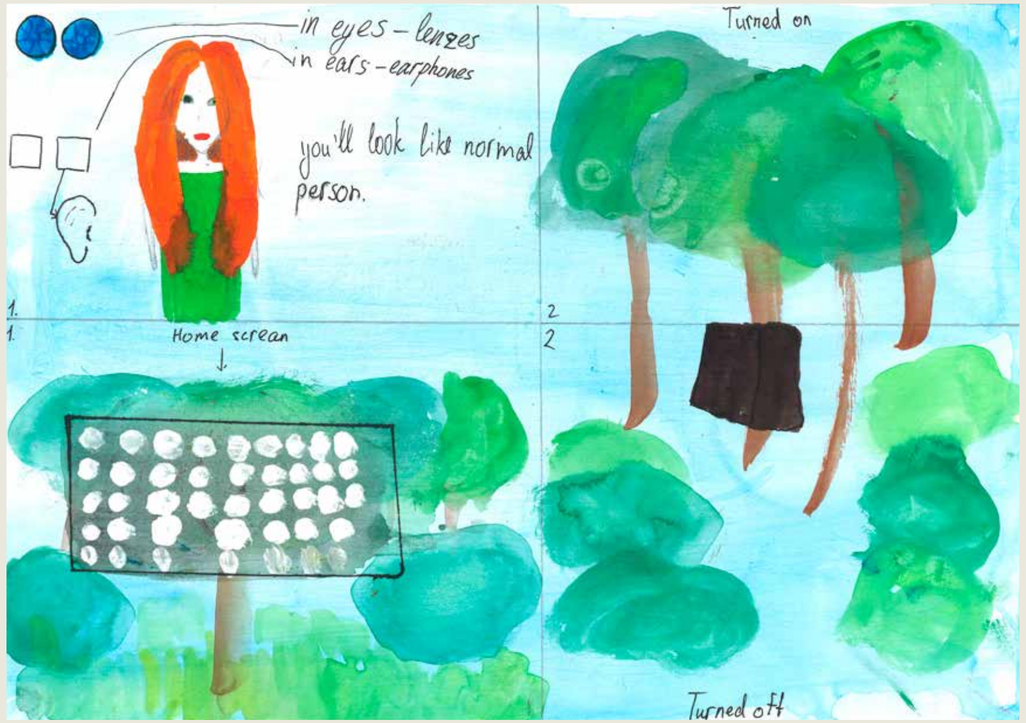
LABORATORY
EU Reference Laboratory for AlterCnatives to Animal Testing , EURL ECVAM
Experimental Platform for Internet Contingencies & Blockchain Technologies, EPIC

PORTFOLIO
28 – Life and health sciences

We made a mask that changes your full body appearance to the person of your choice. (and your voice)
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Biometrics Laboratory, BIOLAB

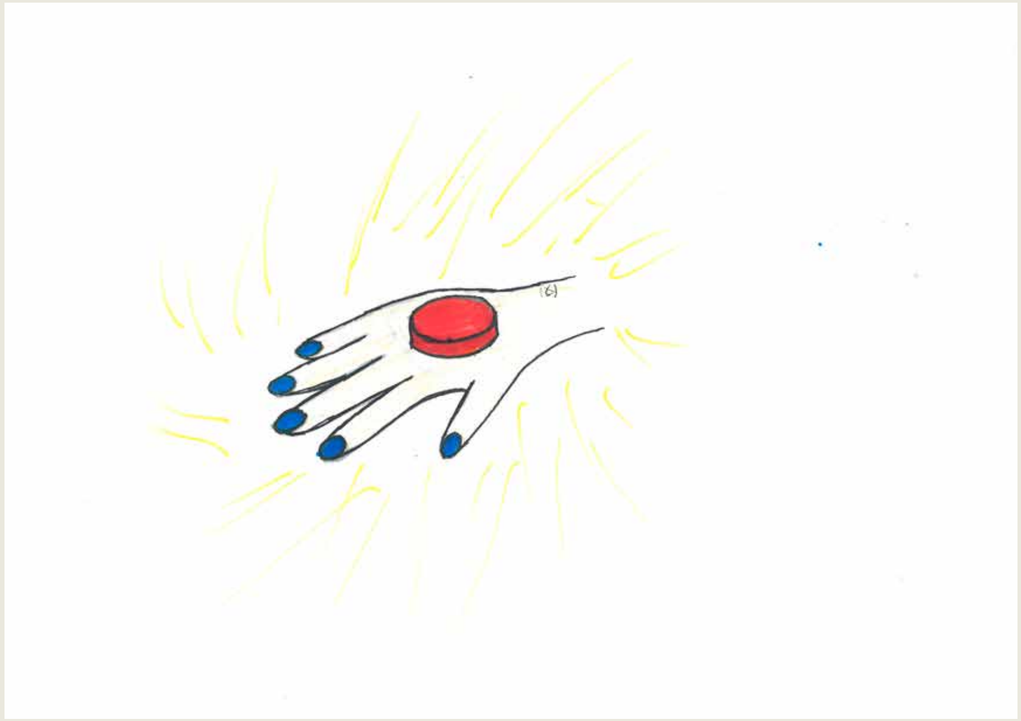
PORTFOLIO
14 – Digital transition, science for security, 30 – Science for security



1. Smart lenzes - your future smartphone in your eyes. Plus functions: 1. you can change your eye colour in special program on ANY colour 2. if you have poor eyesight these lenzes can help you 3. you can do photos and screenshots 4. you can manage it by your fingers, voice and eyes 5. you'll have your assistante" and "2. Invisibly cloak. This cloak takes many fotos one side and project them on other side. Plus functions: 1. you can turn it off 2. you can change its colour. All plus functions do from your smartphone!
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Biometrics Laboratory, BIOLAB

PORTFOLIO
14 – Digital transition, science for security, 28 – Life and health sciences, 30 – Science for security



If you press the red button you become invisible.
SCHOOL European School of Bergen, the Netherlands

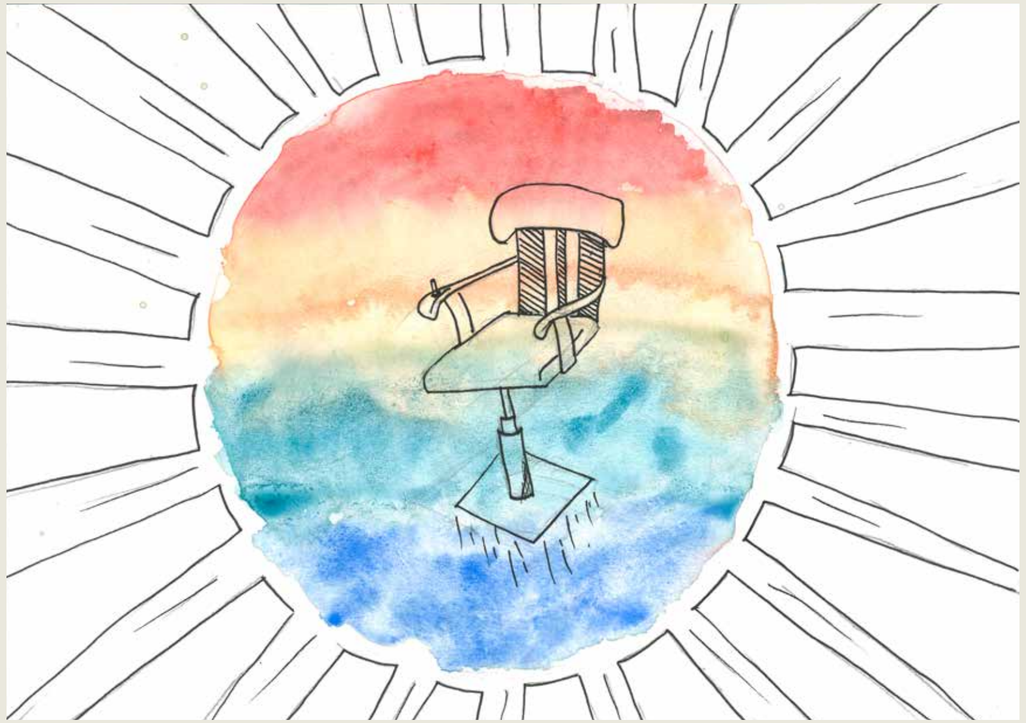
LABORATORY
Biometrics Laboratory, BIOLAB

PORTFOLIO
14 – Digital transition, science for security, 30 – Science for security

The cupboard can give you the clothes that you want.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Nanobiotechnology laboratory, Nanobiotech

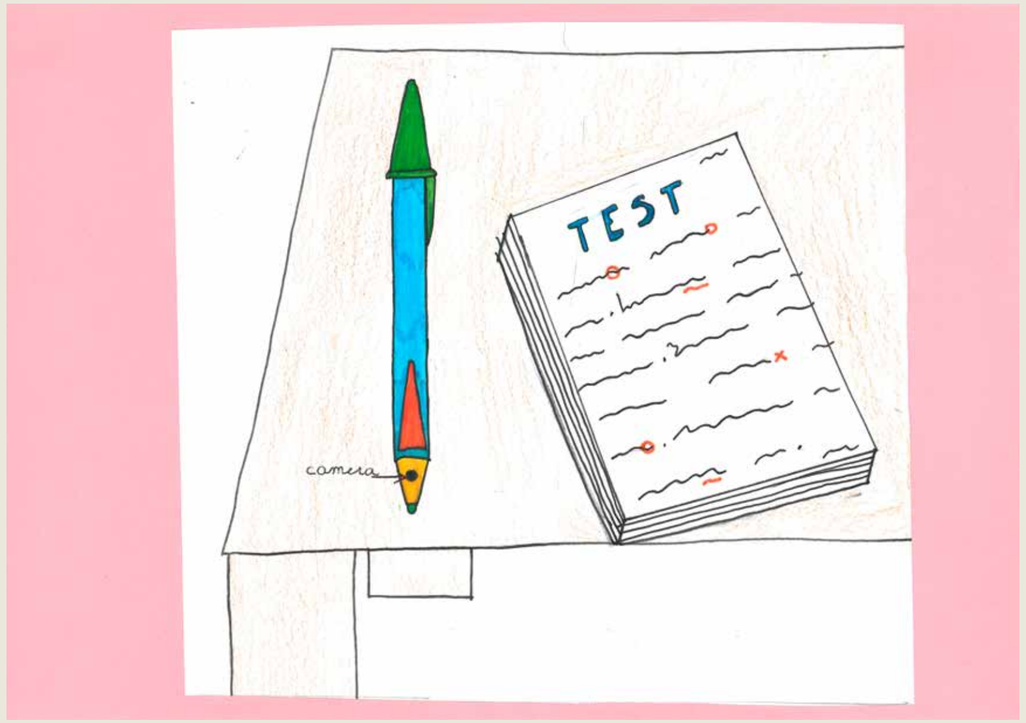
PORTFOLIO
12 – Sustainable materials, 14 – Digital transition



My invention is a levitating chair. This chair levitates and can be used for medical purposes like carrying patients to different rooms, it can sometimes also helps when having to carry heavy objects. It is really easy to use, you turn it on by using the button under the seat and then you point with the joysticks where you want to go and it moves to that direction.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Border Security Research Infrastructure, Border Security RI

PORTFOLIO
6 – Mobility, 19 – Galileo, 28 – Life and health sciences



The invention for school: self-correcting pen.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities, EMSL & GNSS

PORTFOLIO
14 – Digital transition, 26 – Future risks and opportunities, 30 – Science for security

The future digital lab. The invention I drew were glasses that have screen in them and can be used like a computer.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Biometrics Laboratory, BIOLAB

PORTFOLIO
14 – Digital transition, 30 – Science for security

These glasses will make a hologram of what you think about.
SCHOOL European School of Bergen, the Netherlands

LABORATORY
Biometrics Laboratory, BIOLAB

PORTFOLIO
30 – Science for security

ANNEX 1

JRC LABORATORIES

ACRONYM, CATEGORY, LOCATION

1. **Advanced Safeguards Measurement, Monitoring and Modelling Laboratory,**
   AS3ML, Euratom Laboratories, Ispra
2. **Battery Energy Storage Testing,**
   BESTEST, Physical Sciences, Petten
3. **Biometrics Laboratory,**
   BIOLAB, ICT, Ispra
4. **Border Security Research Infrastructure Border Security RI,**
   ICT/Physical/Chemical Sciences, Geel
5. **Digital Forensics Laboratory,**
   DFLab, ICT, Ispra
6. **Digital Tachograph Laboratory,**
   DTLab, ICT, Ispra
7. **Electrolyser Testing Facility,**
   ELTEST, Physical Sciences, Petten
8. **Environmental Biotechnology Laboratory,**
   EBL, Biosciences/Life Science, Ispra
9. **EU Reference Laboratory for Alternatives to Animal Testing,**
   EURL ECVAM, Biosciences/Life Science, Ispra
10. **European Commission Atmospheric Observatory,**
    EC AtmO, Physical Sciences, Ispra
11. **European Crisis Management Laboratory,**
    ECML, ICT, Ispra
12. **European Laboratory for Structural Assessment: Large Hopkinson Bar facility,**
    ELSA – HopLab, Physical Sciences, Ispra
13. **European Laboratory for Structural Assessment: Reaction Wall facility,**
    ELSA - Reaction Wall, Physical Sciences, Ispra
14. **European Microwave Signature Laboratory and EU GNSS Simulation and Receiver Testing Facilities,**
    EMSL & GNSS, Physical Sciences, Ispra
15. **European Nuclear Security Training Centre,**
    EUSECTRA, Euratom Laboratories, Karlsruhe
16. **European Reference Laboratory for Air Pollution,**
    ERLAP, Physical Sciences, Ispra
17. **European Solar Test Installation,**
    ESTI, Physical Sciences, Ispra
18. **Experimental Platform for Internet Contingencies & Blockchain Technologies,**
    EPIC, ICT, Ispra

19. **Food Contact Materials Laboratory,**
FCM, Chemistry, Ispra
20. **Food Fraud Laboratory,**
FFL, Interdisciplinary, Geel
21. **Food Safety & Compliance Laboratory,**
FSC, Interdisciplinary, Geel
22. **Fuels and Materials Research,**
FMR, Euratom Laboratories, Karlsruhe
23. **Genetically Modified Organisms Laboratory,**
GMO, Biosciences / Life Science, Ispra
24. **Greenhouse Gas Flux measurement Tower,**
IT-SR2, Physical Sciences, San Rossore
25. **High Flux Reactor,**
HFR, Euratom Laboratories, Petten
26. **High Pressure Gas Testing Facility,**
GASTEF, Physical Sciences, Petten
27. **Hot Cells Laboratory,**
HC-KA, Euratom Laboratories, Karlsruhe
28. **Ispra Nuclear Safeguards, Security and Standardization Laboratory,**
INS3L, Euratom Laboratories, Ispra
29. **Laboratory for materials ageing in LWR environments,**
AMALIA, Euratom Laboratories, Petten
30. **Large Geometry Secondary Ion Mass Spectrometry Laboratory,**
LG-SIMS, Euratom Laboratories, Karlsruhe
31. **Liquid Lead Laboratory,**
LILLA, Euratom Laboratories, Petten
32. **Marine Optical Laboratory,**
MarLab, Physical Sciences, Ispra
33. **Micro-Characterization Laboratory,**
MCL, Euratom Laboratories, Petten
34. **Nanobiotechnology Laboratory,**
Nanobiotech, Biosciences / Life Science / Interdisciplinary, Ispra
35. **Narcotics Laboratory,**
NARCO, Chemical / Biosciences / ICT, Ispra
36. **Nuclear and Trace Analysis facility,**
NTA, Euratom Laboratories, Karlsruhe
37. **Nuclear Reference Material and Measurement Facility,**
METRO, Euratom Laboratories, Geel
38. **Nuclear target preparation Laboratories,**
TARGET, Euratom Laboratories, Geel

39. **Policy Lab,**
EUPL, Foresight, Bruxelles
40. **Properties of Actinide Materials under Extreme Conditions,**
PAMEC, Euratom Laboratories, Karlsruhe
41. **Radio Spectrum Laboratory,**
RSL, Physical Sciences, Ispra
42. **Radionuclide Metrology laboratories,**
RADMET, Euratom Laboratories, Geel
43. **Reference Materials Production Laboratory,**
RMPL, Interdisciplinary, Geel
44. **SMART GRID Interoperability Laboratory,**
SGILab-Ispra, Physical Sciences / ICT, Ispra
45. **SMART GRID Interoperability Laboratory,**
SGILab-Petten, Physical Sciences / ICT, Petten
46. **Structural Materials Performance Assessment Laboratories,**
SMPA, Euratom Laboratories, Petten
47. **T2 Open Space Laboratory,**
T2 Openlab, ICT, Ispra
48. **Tandem accelerator based fast neutron source,**
MONNET, Euratom Laboratories, Geel
49. **The JRC Neutron Time-of-Flight Facility,**
GELINA, Euratom Laboratories, Geel
50. **Tobacco Laboratory,**
TobLab, Life Science / Chemistry, Geel
51. **Underground laboratory for ultra-low level gamma-ray spectrometry,**
HADES, Euratom Laboratories, Geel
52. **Vehicle Laboratory - European Interoperability Centre and Advanced Vehicle Testing,**
VELA - EIC/AVT, Physical Sciences, Ispra
53. **Vehicle Laboratory Market Surveillance,**
VELA – MaSu, Physical Sciences, Ispra
54. **Water Laboratory,**
WaterLab, Chemistry / Interdisciplinary / Life Science, Ispra

ANNEX 2

JRC PORTFOLIOS

EUROPEAN GREEN DEAL

1 Green transitions
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/green-transitions_en

2 Energy solutions
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/energy-solutions_en

3 Hydrogen
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/hydrogen_en

4 Safe nuclear technology
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/safe-nuclear-technology_en

5 Small modular reactors
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/small-modular-reactors_en

6 Mobility
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/mobility_en

7 Cities and buildings
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/cities-and-buildings_en

8 Climate neutrality
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/climate-neutrality_en

9 Zero pollution
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/zero-pollution_en

10 Healthy biodiversity
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/healthy-biodiversity_en

11 Sustainable food systems
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/sustainable-food-systems_en

12 Sustainable materials
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/sustainable-materials_en

13 Industrial transformations
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/industrial-transformations_en

EUROPE FIT FOR THE DIGITAL AGE

14 Digital transition
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/digital-transition_en

15 Trustworthy AI
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/trustworthy-artificial-intelligence-ai_en

16 Cybersecurity
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/cybersecurity_en

17 Data for science and policy
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/data-science-and-policy_en

18 Earth observation
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/earth-observation_en

19 Galileo
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/global-satellite-navigation-galileo_en

ECONOMY WORKING FOR PEOPLE

20 Inclusive and resilient society
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/inclusive-and-resilient-society_en

21 Education, skills & jobs
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/education-skills-and-jobs_en

22 Economic governance
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/economic-governance_en

23 Territorial intelligence
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/territorial-intelligence_en

26 Future risks & opportunities
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/risks-and-opportunities-future_en

STRONGER EUROPE IN THE WORLD

24 Cooperation & connections
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/international-cooperation-sustainable-and-trusted-connections_en

EUROPEAN WAY OF LIFE

25 Crises management
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/crisis-management_en

27 Health crises responses
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/health-crises-response_en

28 Life and health sciences
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/life-and-health-sciences_en

29 Cancer & non-comm. diseases
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/cancer-and-non-communicable-diseases_en

30 Science for security
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/science-security_en

31 Nuclear compliance assurance
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/nuclear-compliance-assurance_en

32 Population dynamics & migration
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/population-dynamics-and-migration_en

EUROPEAN DEMOCRACY

33 Innovative policymaking
https://joint-research-centre.ec.europa.eu/jrc-science-and-knowledge-activities/innovative-policymaking_en

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct centres. You can find the address of the centre nearest you online https://europa.eu/european-union/contact_en

On the phone or in writing

Europe Direct is a service that answers your questions about the European Union.
You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696,
- via the following form: european-union.europa.eu/contact-eu/write-us_en

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website (european-union.europa.eu).

EU publications

You can view or order EU publications at op.europa.eu/en/publications. Multiple copies of free publications can be obtained by contacting Europe Direct or your local documentation centre (european-union.europa.eu/contact-eu/meet-us_en).

EU law and related documents

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex (eur-lex.europa.eu).

EU open data

The portal data.europa.eu provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.

Science for policy

The Joint Research Centre (JRC) provides independent, evidence-based knowledge and science, supporting EU policies to positively impact society

EU Science Hub
joint-research-centre.ec.europa.eu

Publications Office
of the European Union