

Some examples of combinations and outcomes

Teacher team 1: Math, History, Art

Bigger Picture: Food Waste

Theme: Colour

Action: Experiment

Material: Paper

Outcome: Challenge for students: make a story-telling campaign poster on Fast Food using the calculations of how much food is thrown away, how many km food travels for your fast food and how much it used to be 50 years ago.

Teacher team 2: Math, Physics, Craft

Bigger Picture: Helping Younger Pupils Learn

Theme: Space

Action: Object Design

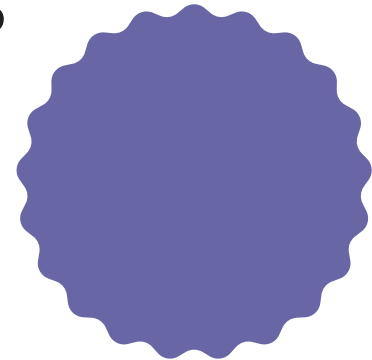
Material: Plastic

Outcome: Challenge for students to make Space related models out of plastic or plastic waste. . Examples could be rovers, a model of the solar system, space ships, space suits and much more...



SMART HANDS

SmartHands Cards



SmartHands Cards instructions

Why do we suggest you use these cards?

These cards can be used to brainstorm together with other teachers teaching other subjects to create multi-disciplinary lessons or workshops. It is also about teaching how to include using the fine motor skills of the hands in learning how to make objects, hold tools and work with different materials. The main focus of using these cards is to combine the head to the hands and make lessons more tangible and easier to understand. Also to make pupils more motivated to learn.

The four categories of cards

1. **Theme:** cards about themes of the different subjects that are taught like geometry, brain, light.
2. **Material & Technology:** this card will make the task visible and tangible.
3. **Action:** what will be done with the material and technology, what will be the outcome.
4. **Bigger Picture:** these cards represent society. What are the issues in the world or in your region?

* **Joker:** you can add this card to your selection to focus more on a subject that you are working on or link it to a question from the work field.

* **Empty Card:** you can also add your own theme, action, material & technology and bigger picture card

How to use the cards

The cards are used best in pairs or small teams, with teachers from different subjects. There are no fixed rules to use the cards, so we give some suggestions on how to use them.

Easy: open the cards and choose one card per category.

Difficult: choose a card per category blind with the option to only change one card if too difficult.

Ideas when to use the cards

Below are some examples in which the cards could really help.

- To set up a workshop or a series of lessons in which you would like to work multi-disciplinary;
- To work together with stakeholders on a societal or regional matter;
- To add some extras to your existing lesson to inspire and motivate your pupils/students;
- To add a practical lesson within your curriculum to teach more craft skills;
- To add some A to STEM lessons;
- To add a STEM subject to your practice lesson.

What card do I start with?

Choosing a category to start with is also your choice. Some teachers thought it worked best to start with the Theme cards, others started with the Bigger Picture cards.

If you work on a workshop with a societal goal, you can best start with the Bigger Picture and work on challenges concerning food waste, sustainability, climate change, etc. If you want to add some practice within your own subject, you can start with a Theme card that is closest to your lesson and ask the other teachers in your group to contribute.

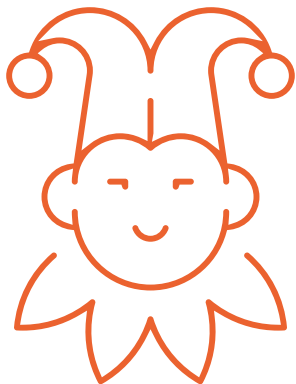
Using the cards, the brainstorm

1. Define why you will use the cards: for a workshop, a lesson or a cooperation with stakeholders?
2. Create a pair or a small group of three or four teachers from different subjects.
3. Choose how you will work with the cards: open or closed.
4. Choose which card is leading considering your working scenario (see Ideas when to use the cards) and select the cards from the other categories.
5. Change a card or add a joker card.
6. Take 5 - 7 minutes to choose your final cards
7. Individually write down some ideas of activities
8. Present all the ideas and combine the similar ideas.
9. Share your ideas and start to brainstorm for the final project.



SMART HANDS

JOKER

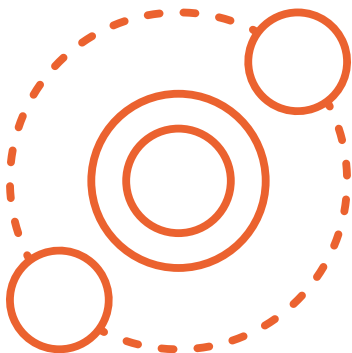


THEME:

THEME

Gravity

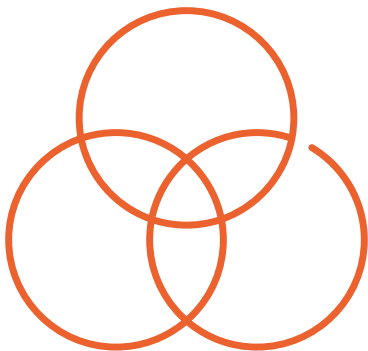
Legend has it that a young Isaac Newton was sitting in an orchard when an apple fell on his head and prompted him to come up with his law of gravity. It's hard to imagine a more fundamental aspect of life on the Earth than gravity. But does it really exist? How can you tell?



THEME

Colour

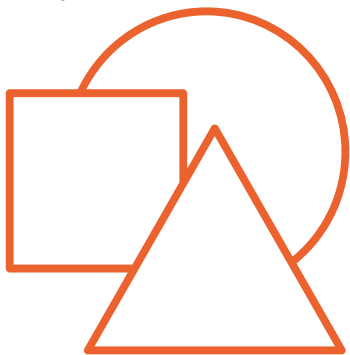
Colour is in the eyes of the beholder. In physics, colour might be associated with electromagnetic radiation of a certain range of wavelengths and in art it might be associated with pigments, hue, saturation or aesthetics. What is colour for you?



THEME

Geometry

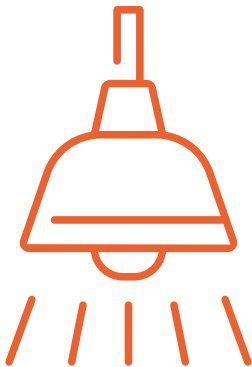
Originally developed to model the physical world, geometry has applications in almost all sciences, and in many more fields like art, architecture. What aspects of geometry would you like to showcase? (Think of symmetry, patterns, shapes, facts, modular structures)



THEME

Light

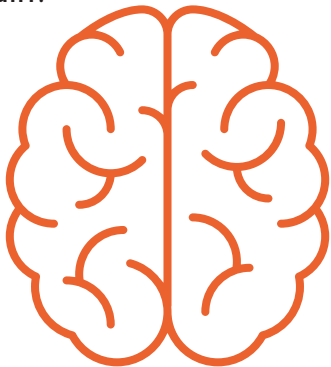
Light has always fascinated people. It is both particle and wave. Sunlight provides the energy that sustains life on earth in all its forms. Where do you use light? What properties of light can you showcase?



THEME

Brain

The brain is the most complex organ in the human body. As the bodies super computer it controls thought, memory, emotion, touch, body movement, vision, breathing, temperature, hunger and as such is the source of all qualities that define humanity. What can you say about the brain?

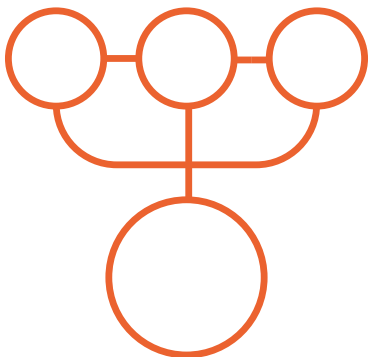


THEME



Tree of Life

For the first time, a collaborative effort compiled the most comprehensive tree of life called the *Open Tree of Life*. Today, some 2.3 million species have been identified and named, with more being discovered all the time. How do you think they are all connected?



THEME

Flora

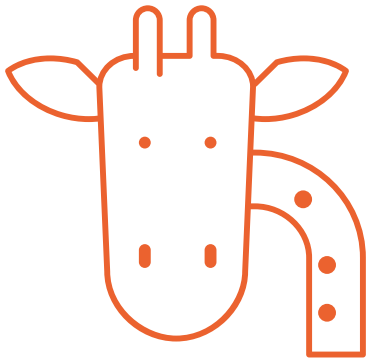
All around us we can find flora, even in cities in the form of what we call weed. Flora refers to the plant life of a particular region, the period they grow and their habitat. What flora grows in your region? Do they originate from your region?



THEME

Fauna

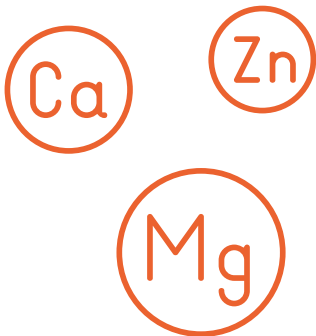
Fauna stands for all animal life around you. The birds, the fish, the animals, the frogs and salamanders and reptiles. What fauna lives in your region and when do you see them? How many are there now and how many used to live in your region 100 years ago?



THEME

Chemical Elements

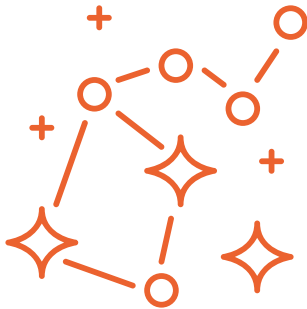
There are 118 chemical elements that we know of. You may have talked about some elements like oxygen, iron or carbon, but there is much more to discover. One particle of each element is called an atom and each element has a different kind of atom structure.



THEME

Space

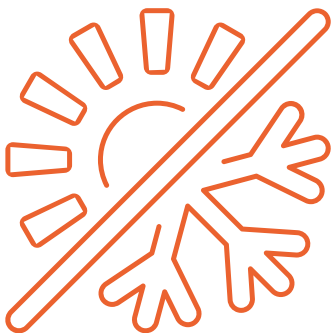
What do we know about our location in the Universe? Earth is located in the Solar System. Our Solar System is located in a galaxy called the Milkyway. Inside the Milkyway there are at least 100 billion stars. We also know that the Milkyway is not the only galaxy, far from it. There are at least 100 billion galaxies in the known Universe.



THEME

Temperature

We measure temperature daily. We check the thermometer to see how to dress or we adjust the temperature to cook food. If we go to atomic level, high temperature means that particles move very fast and low temperature means that particles move very slowly.



THEME

Sound

When you hear a sound from a guitar string, many things have happened. The string is vibrating, sound energy travels through air in waves, wave make the eardrum vibrate, sesorial information travels to the brain where sound sensation is formed. Sound can be studied from many angles. What is your's?



THEME

Motion

Everything is moving constantly: people, animals, traffic, atoms and even the Earth is rotating around the Sun. Motion can appear in the movement of a robot, danced in a performance or acted in a play.



THEME

States of Matter

Water can have three different states: gas, liquid and solid. But did you know that all other substances have these same states? Can you imagine gold in a gas state or helium as a liquid? What do you know about the fourth state called plasma?



THEME

Chemical Reaction

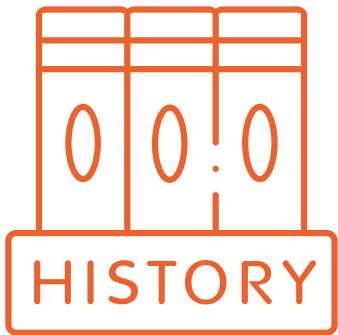
Chemical reactions can be very slow like rusting of iron or very fast like an explosion of dynamite. Chemical reactions can create beautiful colours or weird smells. What kind of chemical reactions happen in plants or animals? Why are chemical reactions vital for humans?



THEME

History

History is the term for past events. Usually stories are written or drawn. You can learn from them to put different stories into context. What are important events that have happened in your region that had a lot of effect?

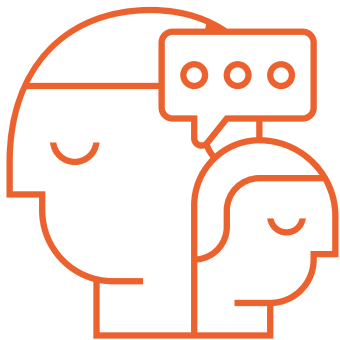


THEME

Philosophy

What is logic, are there any methods to define a theory? Ask questions about reason and reasoning, how do we learn, what are morals and ethics?

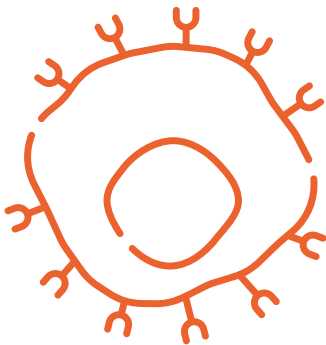
Try to think of a question to add to your other cards to create a new context or rephrase your taks.



THEME

Cell

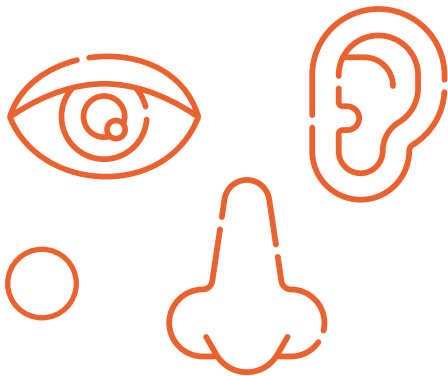
A single cell is often a complete organism in itself, such as a bacterium or yeast. Other cells acquire specialised functions as they mature. Whether as an individual unit or as a contributing part of a larger organism, what do you makes a cell interesting?



THEME

Senses

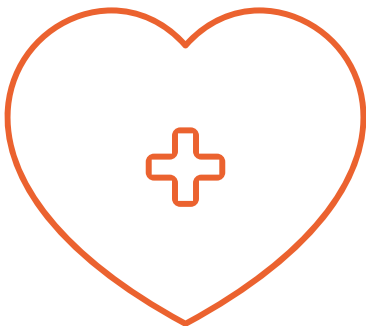
How does the human body receive sensory information? And how does that information affect the way in which we understand and navigate the world around us? How can we tap into Sight, Sound, Smell, Taste, and Touch and open up new multisensory dimensions?



THEME

Personal Health

Personal Health is the ability to take charge of your health by making conscious decisions. It not only refers to the physical well being of an individual but it also comprises the wellness of emotional, intellect, social, economical, spiritual and other areas of life.



THEME

Ecosystem

An ecosystem is a geographic area where plants, animals, and other organisms, as well as weather and landscape, work together to form a bubble of life. Every factor in an ecosystem depends on every other factor, either directly or indirectly.



THEME

Psychology

A scientific study of the mind and behaviour. The way we act is influenced by different aspects: biological, psychodynamic, behavioural, cognitive and humanistic. Can you think of a psychological experiment or survey to learn more about some aspects of psychology?



THEME

Geography

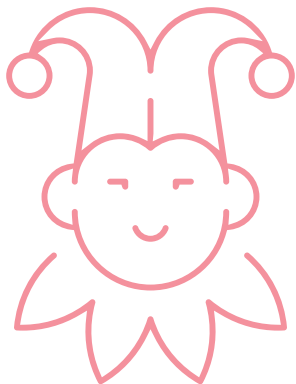
Science devoted to studying the lands, inhabitants and phenomena of Earth. What is our planet made of? How have the oceans and continents changed during the past? Why do people live where they are now? What is happening to our climate now?





SMART HANDS

JOKER

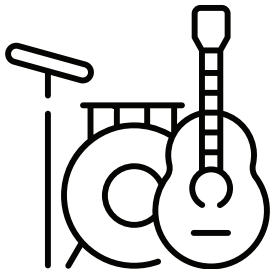


ACTION:

ACTION:

Make Music

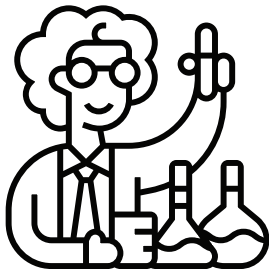
Make music or use music to showcase your theme. Can you make a musical instrument, to help in your endeavor? Can you write or find songs about your theme?



ACTION:

Experiment

Design an experiment to study your theme. How does it work? What steps will a young researcher need to take in order to find the answer to the big question?



ACTION:

Object Design

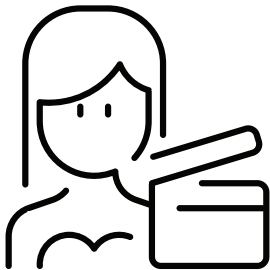
Design and prototype an object that reflects on your theme. It can be a teaching instrument, an art-work or an installation. Think about the ways students will interact with your object. Try co-creating this object with them.



ACTION:

Video

Make a video or think of a framework students might be able to use in order to shoot their own movies or documentaries given the theme you chose.



ACTION:

Dance/Theatre

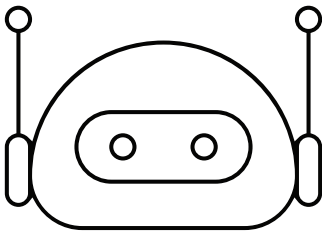
Dance and drama are great vehicles for teaching scientific topics. You can explain difficult concepts by combining them with a fascinating story. This can also facilitate the long term retention of the principles you want to showcase. Give it a try.



ACTION:

Robotics

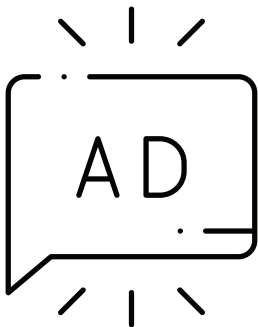
A robot is a machine that can be programmed to function automatically. Robots can help humans in different tasks at home, work in factories or even be our pets. How can we build our own robots? Would you like to have a robot as a friend?



ACTION:

Advertising

Advertising is a means of communication. To be able to run a campaign, draw a poster or make a tiktok video you will first have to decide on a product, service or event that you would like to advertise. Think of what are the key elements your audience needs to know!



ACTION:

Art

Art is an expression of a person resulting in a human activity or a product. This is created using imagination or creativity. Crafts are tools for creating this expression. What artistic expression can help bring the cards in front of you further?





SMART HANDS

JOKER



MATERIAL & TECHNOLOGY

MATERIAL & TECHNOLOGY

Paper / Card Stock

Paper is a versatile material. You can draw on it fold it, cut it and shape it with easy to use hand tools but also with CNC equipment. Pick between the following technologies to realise your project.

With paper you can:

1

cut shapes and fold it into different structures

2

make something out of paper mache

3

use a CNC Cutter to construct more complex shapes

+

what is paper made of?

MATERIAL & TECHNOLOGY

Recycled materials

A lot of material you want to use to make something, can be found in the waste buckets! We throw away a lot of valuable material. What can we do with plastic bottles, cans, newspapers, toys, magazines, clothes, etc?

Try to:

1

collect plastic bottles to cut out, glue or link them together

2

collect paper and carton to cut shapes or fold to structures

3

collect old t-shirts and trousers and make new cloths

+

Ask school what material they sort and throw away.

MATERIAL & TECHNOLOGY

Fabric

A person uses fabric every day. We sleep on and below fabric, we open curtains in the morning, the clothes you put on, a table cloth, the seat of the car or bicycle saddle. We also throw away a lot of fabric.

With fabric you can:

1

cut it into stripes to weave, macrame, knit or make knots

2

make small dolls or avatars

3

sew it together to make clothes or costumes

+

What are fabrics made of, where do fabrics come from?

MATERIAL & TECHNOLOGY

Clay

Clay is a type of fine-grained natural soil material containing clay minerals. If it is wet you can mold it with your hands and make shapes. If it is dry, you cannot mold it anymore.

With clay you can:

1

mold it into boxes, spheres, triangles and weird shapes

2

use iron thread to make a shape, paste clay over it to make figures

3

make tiles, let them dry and engrave with laser cutter

+

Try the clay in your area, dig from the ground and see what you can make.

MATERIAL & TECHNOLOGY

Electronics

Electronic devices are plain fun, there is nothing more fulfilling than lighting up an LED. Or is there?

Think about how you can spice up your theme by adding:

1 simple circuits

2 complex circuits that include sound or movement

3 sensors and programmable electronics

+

Can you salvage old electronics?

MATERIAL & TECHNOLOGY

Body

With your own body you can also express subjects or stories. You can use it as a 'material', a means to use, in your task.

With your body you can:

1

form shapes and letters

2

tell a story without using words, also use your face

3

dance, walk, run, use the movements

+

How much water does your body contain?

MATERIAL & TECHNOLOGY

Plastic

Plastic is a versatile material. It comes in many different shapes and sizes and is made from different sources.

Depending on the plastic you want to use you can:

1

cut acrylic and vinyl with CNC machines

2

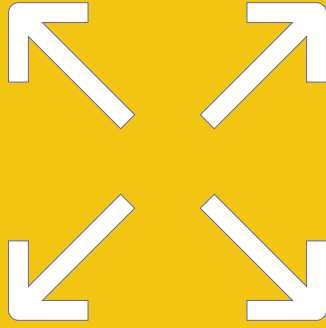
play with polystyrene, cut it with a hot rod or shape it yourself

3

make your own biodegradable plastic

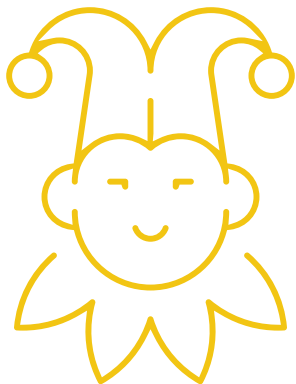
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What plastic objects do you touch or use daily?



SMART HANDS

JOKER



BIGGER PICTURE

BIGGER PICTURE

Sustainability

People have gotten used to use some products only once and then throw it away.

Quite a waste, because this product is valuable! A lot of effort and energy has been put into making this product and material it is made of. So, let's use the product or the material as long as possible!

So what can you do? Choose one of these options: Redesign, Reduce, Reuse, Repair, Refurbish or Recycle. Add it to the tasks in making an item.

BIGGER PICTURE

Food Waste

In Europe more food is grown than we use. A lot of food is thrown away. People buy too much. Restaurants throw away what cannot be used anymore. Supermarkets throw away what has passed expiration date. Or the crops are not good enough, like the carrots have gone crooked due to heavy rains or droughts.

A lot of initiatives have started to prevent the food waste (shared fridges on the street, grow mushrooms on coffee waste, community soup service, cooking together, etc). What can your pupils/students think of how to prevent food waste at school or in your region?

BIGGER PICTURE

Helping Younger Students Learn

Teaching the young pupils, can be a good experience for the older pupils. The older pupils learn how to practise what they have learned themselves and to transfer it to a person who is still learning.

It will give them the knowledge of teaching, leading and reflection. For the young pupils it is sometimes easier to ask an older pupil than the teacher and this can help to lower the threshold.

BIGGER PICTURE

Create a Happy School

How can a green, waste free, colourful, easy to navigate and healthy school contribute to the atmosphere of the school? Think of challenges for the pupils to create something to the benefit of the school. A system to sort different kinds of waste, school (food) gardens, grow mushrooms on coffee waste, comfortable lounge furniture, handy apps, etc. What would you like to see at your school?

BIGGER PICTURE

Community Maker Space in School

Create a place where pupils and teachers can tinker and make things to facilitate to develop their inventiveness and tacit knowledge. This can be a separate room, a part of the library or a corner in a room. If you don't have a lot of room, a corner with a closet with paper, a bag with textile waste, some scissors, sewing material and glue can already be a start. A 3D printer can be put in the library and ask the librarians if they like to help to find knowledge.

BIGGER PICTURE



Human Rights

The Universal Declaration of Human Rights (UDHR) was proclaimed by the United Nations General Assembly in Paris on 10 December 1948. It contains 30 articles and states common ground rights for the global society - starting freedom of thought, conscience and religion but also the rights to standard conditions for living or the right for leisure and rest.

BIGGER PICTURE

Gender Equality

We live in a world with an enormous variety of people. We are tall, small, we have different colours, shapes, different genders and different sexual orientations. There are boys and girls and people in between. Boys and girls who like each other, also boys and boys, girls and girls and more. We are all people. We dream the same dreams, we laugh together, so how can we design a world where we are all treated the same way?

BIGGER PICTURE

Entrepreneurship

To learn how to become more independent and learn how to channel your creativity and innovative ideas into creating a business can be done through Entrepreneurship. Think of setting up, developing, testing and launching a business. What to do when things go wrong, what to do with success. What will your business look like?

BIGGER PICTURE

Cultural Heritage

Products, monuments, artefacts and sites have a diversity of special values including symbolic, historic, artistic, aesthetic, anthropological, scientific and social significance. They tell stories about cultures, customs, beliefs and more. Usually linked to specific crafts from that time. What cultural heritage do you have in your region? What crafts (tools and materials) were used to make it? How can you use this knowledge as inspiration for your 21st ideas?

BIGGER PICTURE

Your own health

You can influence your health by eating healthy food, but also mentally to be kind to yourself. If you feel good inside you can cope more easily with troubles on your way. Try to notice what really happens inside you when you eat good stuff and when you eat bad stuff. What food is good for you and what is produced in your area?