



# **GLOSSAR ECO-MISSION**

## **ÜBERSICHT MINT-THEMEN**

### **(ENG)**

## Climate Change

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Consequences of climate change for Germany	If climate change continues in the same way it has so far, in 50 years Germany will only have 5 reliable skiing areas instead of the 27 it has today. It would also become nearly impossible to grow hops in southern Germany (which accounts for 1/3 of global demand) due to frequent severe weather and flooding. In Eastern Germany, on the other hand, people will have to deal with forest fires and severe weather, while water levels in Northern Germany will continue to rise. This is quite a terrible prognosis.	Apple trees are not flexible with their growing conditions and need to grow in super-wet swamp-like conditions in order to grow ideally.	a)true <b>b&gt;false</b>	Level 1/0

## Colors

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Colors	Colors are really just sensory impressions created by light. These perceptions can be highly individual and can vary depending on the condition of one's eyes, the sensitivity of light receptors, and any possible illnesses. Even the quality of different materials and their ability to absorb or reflect light can affect how we perceive colors. This means that there is practically an endless range of colors – far more than the human eye can perceive.	A rainbow forms when light is reflected through raindrops and is refracted and dispersed into its individual colors. The colors of the rainbow are called...?	a)primary colors <b>b)spectral colors</b>	Level 3/13

## Crops

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Apples/Peas	This is a good place to plant apple trees and peas. While apple trees tend to be very flexible in terms of their growing conditions and still grow well in less than ideal soil conditions, peas require very specific soil conditions. Both crops need a well-drained soil that is not too wet. Depending on the location apple trees should be planted either in early spring (North) or in fall (south). Peas are not tolerant of high levels of nitrogen in the soil (because they are nitrogen fixing plants),	Apples and peas need to grow in extremely wet swamp-like conditions in order to grow ideally.	a)true <b>b&gt;false</b>	Level 4

	which means that a high concentration of fertilizer would be extremely unhealthy for the plants. While apples - also regarded as energy boosters - are full of calcium, magnesium and phosphor peas are full of proteins.			
Carrots/ Potatoes/ Strawberries	This is a good place to plant carrots, potatoes and strawberries. Carrots, potatoes and strawberries all have a high nutritional value. They are packed with vitamins, calcium and many more, which is why they enjoy a high popularity. In order to grow properly, all of them need water on a regular basis plus sun and light. Potatoes need a well-drained soil, while the soil for carrots should be loose and deep. The soil for perfect strawberries should be neutral or slightly acid. With the right conditions, all of them grow very easily.	Germany is the world's largest potato producer.	a) true <b>b)false</b> (it is the seventh largest)	
Lettuce	This is a good soil to plant lettuce. Lettuce plants prefer soil that is high in humus. In order to grow fast, they need a steady supply of nitrogen and need plenty of compost. The soil should remain moist but well drained. They should be harvested when full size but just before maturity because mature lettuce gets bitter and woody and will go bad quickly. Consuming lettuce is extremely beneficial as it contains a lot of nutrients, such as vitamin A, vitamin K, fiber and minerals.	Why is it important to pick lettuce plants before they are mature?	<b>a)mature lettuce gets bitter and woody</b> b)mature lettuce has too much humus	Level 4
Parsnip/ Tomatoes	This is a good spot to plant parsnip and tomatoes. Parsnip and tomatoes are a wonderful source of antioxidants and vitamins. Not only are they very nutritious, but they also have tons of health benefits. Both crops can be eaten raw or cooked. They need well-drained soil but in comparison to parsnip, tomatoes are usually not harvested in winter, but rather in late summer.	Will tomatoes grow well in soil that is not loose and well-drained?	a)yes <b>b)no</b>	
Spinach/ Corn/ Cabbage/	This is a good location to plant spinach, corn and cabbage. Spinach can be even planted twice a year. But all of those crops must be planted shortly before (Cabbage and spinach) or after the last frost in spring (Corn). Moreover,they all need well-drained soil and have to be watered regularly. The hard work will pay off: All of them contain a lot of antioxidants. Corn contains blood sugar benefits, cabbage is said to prevent cancer and spinach is at the top for nutrient richness, as it contains vitamins, minerals, antioxidants and works against inflammation.	Cabbages kept at temperatures that are too warm during maturation will spoil.	<b>a&gt;true</b> b>false	Level 4

Squash	This is a good spot to plant squash. Squash is a plant that grows best in summer. This plant is extremely easy to grow as long as one keeps in mind that squash needs warm temperature, fertile soil, and steady moisture. The soil should be loose, so the planter should work in a lot of organic material (compost and manure) and fertilizer. Keep in mind that squash is a heavy feeder of nutrients such as nitrogen.	Given the fact that squash consumes nutrients such as nitrogen, would it be a good idea to plant peas and squash together?	a)yes <b>b)no</b>	
--------	---	--	-------------------	--

## Energy

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
An energy transition enacted by law?	The energy transition means that we will use fewer and fewer fossil energy resources (coal, oil, and natural gas) and nuclear energy. Instead, renewable energy resources are meant to replace them. In Germany, the Renewable Energy Sources Act was enacted in 2000 for this reason. It states that Germany's power supply should consist of more and more renewable energy sources. By 2020 at least 35% and by 2050 at least 80% of electricity in Germany should come from renewable energy sources. The prices for electricity from renewable energy sources are also set in this law. This means that investors who want to build wind turbines, for example, can be certain that their investments will be worthwhile.	Which country accounts for the highest percentage of nuclear power? a)The USA, b)Germany, or c)France?	a)USA b)Germany <b>c)France</b>	Level 3
Phasing out nuclear energy in Germany	Germany is the first country in the world to phase out the use of nuclear energy. By 2022, all nuclear power plants in Germany are to be closed. Eight of the oldest plants have already been closed because allowing them to continue to produce electricity is too dangerous. Six other plants will be decommissioned by 2021 at the latest. By then, all energy should come from renewable resources. In 2015, however, only 32.6% of energy was coming from the renewable energy sources of wind and solar power, biomass, geothermal energy, and hydropower.	What percentage of renewable energy comes from wind power? a)10%, b)15%, c)more than 20%?	a)10% b)15% <b>c)23%</b>	Level 3
Renewable Energy	There are many different kinds of energy. Renewable energies are sources of energy that exist in unlimited amounts on planet Earth. This includes solar power, wind power, and hydropower as well as bioenergy from organic waste and geothermal energy. These energy	Which renewable energy resource is currently the most important for energy production?	a)wind power <b>b)bioenergy</b> c)hydropower	Level 3

	resources constantly replenish themselves without harming the environment. The opposite of renewable energy is fossil energy, which is obtained from burning fossil fuels such as coal, natural gas, and oil. There is only a finite supply of these natural fuels on Earth. It took millions of years to produce them and they will eventually be depleted. The transition from fossil energy and nuclear energy to renewable sources of energy is called the energy transition (Energiewende in German).	a)Wind power, b)bioenergy, c)hydropower?		
--	--	--	--	--

## Environmental Pollution

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Earth Overshoot Day	Did you know that we can actually measure the effect that the growing human population has on our planet? Earth Overshoot Day marks the date when humanity's resource consumption exceeds the Earth's capacity to regenerate those resources within that same year. This means that from that day forward, we are consuming much more food, wood, or water than the Earth can reproduce. In 1987, that day was December 19th. In 2016, it was August 8th.	The earlier that Earth Overshoot Day occurs in a year, the better it is for our environment.	a>true <b>b&gt;false</b>	Level 1/0
Pollution	Exhaust emissions, wastewater, (toxic) waste, radiation, light, and noise are all examples of things that can pollute our environment. Pollution is different from the active destruction of the environment, such as deforestation, because pollution tends to be the result of undesirable waste and materials from the production of goods. Nevertheless, many people around the world die from the effects of environmental pollution each year (12.6 million in 2015.)	Similar to environmental destruction, environmental pollution directly destroys ecosystems.	a>true <b>b&gt;false</b>	Level 1/0

## Geothermal Energy

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
How does geothermal energy work?	How can the heat of the Earth be turned into electricity? In order for us to be able to use geothermal energy, shafts first have to be drilled into the Earth's crust. At depths of up to 5,000 m (approx. 3.1 miles), there are hot layers of rock, whose heat can be used for energy. Cold	Which form of water drives the turbines to generate electricity?	a)liquid <b>b)gas (steam)</b>	Level 3/5

	<p>water is pumped down into a first shaft. There it evaporates and rises to the surface through a second shaft as hot steam. While rising to the surface, the steam activates steam turbines that generate electricity. A similar effect can be achieved by drilling holes that are not quite as deep, for example with a geothermal heat pump. Volcanoes, hot springs and geysers are natural outcomes of geothermal energy.</p>			
The advantages and disadvantages of geothermal energy	<p>Did you know that the first 3 km (1.86 miles) of the Earth's crust contain enough energy to supply all the people around the world with enough heat for 100,000 years? For this reason, geothermal energy is one of the most important sources of energy for the future. However, drilling to these depths can also lead to hazards such as local earthquakes. Another disadvantage is that building geothermal power plants is very expensive and takes up a lot of space. Nevertheless, geothermal power plants are profitable, especially in areas with geoanomalies where a lot of energy can be produced even when the drilling does not go as deep.</p>	Question: Does geothermal energy depend on the weather?	a)no b)yes	Level 3/6
Geothermal energy in Germany	<p>Geothermal energy is the generation of energy (heat or electricity) by using the heat of the Earth. In Germany, around 25 GWh are produced this way, which covers the annual electricity demand for 8,300 two-person households. The German government's goal is to generate 1,654 GWh of electricity per year through geothermal energy by 2020. Politicians, businesses, and researchers, for example at the Helmholtz Centre Potsdam GFZ German Research Centre, are currently working to make this possible.</p>	Question: When will approx. 550,000 two-person households in Germany be supplied with geothermal energy?	a)2020 b)2050	Level 3/6
Geothermal heat pump	<p>A geothermal heat pump allows residential households to generate up to 80% of their heat (heating, warm water) themselves. Drilling is required for these systems just as in large power plants. These drillings must be approved since geothermal heat and the earth under a piece of property cannot be owned in Germany. This ensures that the drilling is only done at safe sites and that it will not pose any hazards. There are currently around 450,000 geothermal heat pumps in German households.</p>	Question: Can anyone in Germany install a geothermal heat pump when they build a house?	a)yes, with approval b) <b>no, there are sites where drilling is not approved</b>	Level 3/6

## Housing

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Bamboo houses	Bamboo is one of the fastest growing and strongest plants in the world. In China, this plant plays an important role in the construction industry due to its strength. Bamboos practicality stems additionally from its peculiar ability to regenerate after being cut, which ensures an endless supply of the plant. A native plant on 5 continents, bamboo can be found almost anywhere in the world except for Europe and Antarctica. In ancient times, the Chinese used to make their dwellings out of bamboo. Nowadays, modern architects are realizing the practicality of using bamboo and are utilizing bamboo more and more in the construction industry. A house made of bamboo, therefore will be structurally very strong.	Bamboo is a practical building material because of its strength and abundance.	<b>a)true</b> b>false	Level 4
Clay House	Clay houses are very eco-friendly. This is why many people decide to build their houses out of clay. But there are many more advantages: Not only are they cheaper to build than traditional houses but they are also extremely stable and do not suffer when weather conditions are bad. Contrary to wooden houses they are even fire resistant, which is a big plus!	Clay houses share a characteristic with wooden houses: They stay warm in winter and chilly in summer.	<b>a) true</b> b) false	Level 4
Coconut Leaf Houses	Coconut leave houses have thatched roofs and walls, which means that the vegetation is layered so that any water that may fall on the house is shed away from the inner roof. This keeps the house waterproof and is especially practical in areas with a lot of rain. This sort of housing style is still used by builders in developing countries, because it is a cheap bulding material to utilize and the construction takes a short time. As the name implies, this type of housing is popular in tropical areas.	This type of housing is used frequently by builders in 1st world countries	a>true <b>b&gt;false</b>	Level 4
Log Cabins/Wooden House	Log Cabins are structures made of wooden logs stacked on top of each other. In the early days, they were seen as a practical form of housing because they were easy to disassemble, carry around, and built again. These types of houses were typically common in northern Europe and in American fronteir settlements earlier in American history.	Log cabins are immobile and cannot be moved around	a>true <b>b&gt;false</b>	Level 4

Stilt Houses	Stilt houses are elevated houses built on stilts and were built to keep houses from flooding and to keep out pests. They are present in Oceania, northeastern Nicaragua, northern Brazil, South East Asia, Papua New Guinea, and West Africa. In the Arctic, houses built on permafrost are built of stilts as well. This is to keep the house stable by keeping the permafrost from melting underneath the house	Why were stilt houses built? a)to keep houses from getting flooded b) to keep pests out c)neither d)both	a)to keep houses from getting flooded b) to keep pests out c)neither <b>d)both</b>	Level 4
Treehouse	Building a treehouse requires careful planning. The tree should be healthy and not too young or too old. Branches should be strong, roots should be deep. Ideal trees include oak or apple trees. There are different methods to build a treehouse. One of them is the post method. In this case, the house is provided with support posts that sink into the ground and don't damage the tree. Obviously, living in a treehouse is very eco-friendly which is why many people decide to build them and more and more hotels offer their guests overnight stays in treehouses.	The perfect tree for a treehouse is a very young tree.	a>true <b>b&gt;false</b>	

## Natural Disasters

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Forests protect against avalanches	Avalanches are a considerable danger for residents of Germany's mountainous regions. Did you know that healthy forests are the best protection against avalanches? The trees prevent solid snow cover from forming on the mountainside. And if there is no solid snow cover, then snow cannot begin sliding off the mountain. Protecting nature thus provides protection for people as well. In the Alps, the highest mountains in Europe, over 100 people are killed by avalanches each year.	Guess: How many people are killed by avalanches each year in the Alps, the highest mountains in Europe? a)50, b)75, c)more than 100?	a)50 b)75 <b>c)more than 100</b>	Level 2/3
Levees (Dikes)	"Wer nicht deichen will, muss weichen" is a North German saying that roughly translates to: "Whoever doesn't want to build a levee is going to get soaked/will have to move." A levee (also known as a dike) is a protective wall along the coast of the mainland that can be up to 100 meters long and 8 meters high (approx. 328 ft. long and 26 ft. high). It is made of sand and earth. The roots of grass help to stabilize it. In some areas, herds of sheep tread over levees so that they stay firm	Guess: How many kilometers of levees are there in Germany?	<b>a)1,200 km</b> b)560km	Level 2/3

	and compacted. For centuries, the people on Germany's coastlines have been struggling with the destructive power of the sea. As sea levels continue to rise due to global warming, levee construction will be more and more important.			
Tsunamis	Even though they are sometimes called tidal waves, tsunamis are not created by the gravitational pull of the moon, but by a large-scale displacement of water. They can be a result of underwater earthquakes, volcanic eruptions, or explosions. Because their wavelengths far exceed that of tidal waves, tsunamis usually have disastrous effects. The 2004 Indian Ocean tsunami, for example, was one of the deadliest natural disasters in history, killing 230,000 people in 14 countries.	Even though they have a different origin, the effects of tsunamis are similar to tidal waves.	a)true <b>b&gt;false</b>	Level 2/3

## Ph Values

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Ph Values	Although water is usually clear, it isn't always neutral. Depending on the acidity of the water, water can be either an acid (acidic) or a base (alkaline). In chemistry, acidity is referred to in terms of pH value. The pH value is measured on a scale of 1 to 14. Lemon juice, for example, has a pH value of 2 and is thus quite acidic. A liquid with a pH value of 3, such as apple juice spritzer (Apfelschorle), is ten-times less acidic than lemon juice. Water that feels soapy is alkaline (a base). Water containing detergent has a pH value of around 9. Soils also have a pH value, which is important for plant growth. An ideal pH value is in the range of 5 to 7. Soils that are significantly more acidic with a pH value under 5 are not suitable for growing plants.	The best water quality has a pH value of 7. True or false?	<b>a&gt;true</b> b>false	Level 3/8

## Plants

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Philodendron	Philodendron means "tree friend" This plant probably got its name because it is a climbing plant that prefers to climb high into the tops of trees. Some species even have heart shaped leaves with a	If a cat eats philodendron, this could cause: a) Cardiac arrest	a)cardiac arrest b)vomiting <b>c)kidney damage</b>	Level 3/11

	diameter of up to 30 cm (approx. 12"). People and animals, however, should be careful with philodendron since it contains toxins that can cause skin irritations. If philodendron is eaten, it can cause burning in the mouth and swelling of the mucous membranes and the tongue. This is followed by nausea, vomiting as well as gastro-intestinal problems with diarrhea. The plant is also toxic for dogs and cats. The plant is primarily found in tropical regions of the Americas.	b) Vomiting c) Kidney damage		
--	---	---------------------------------	--	--

## Recycling

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Diaper recycling	Disposable diapers are very practical. After all, who wants to wash diapers every day? Nevertheless, this produces a lot of trash. The start-up DYCLE (Diaper Cycle) wants to change this. Together with the Technical University of Berlin and other partners, they are developing a recycling system that can generate fertile black humus from diapers. Families in Berlin, Germany, tested the project in 2015. The soil obtained from the project is meant to be used as fertilizer for fruit trees.	Disposable diapers account for 10% of residual waste in Germany. True or false.	<b>a)true</b> b>false	Level 1/0

## Scales

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Scales	Asking for directions in Germany isn't quite as easy as one might think. After all, Germany uses different units of measurement. There a mile is 1.609 km. And if you are going 90 mph in a car, then you would be driving 144 km/h. Even weights are different: 1 lb. = 0.454 kg. Germans are thus in for a big surprise when they step on a scale in the US.	10 miles are equivalent to how many km?	a)1,609 km <b>b)16.09 km</b>	Level 2/2

## Soil types

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Calcareous soil (chalky soil)	Calcareous soil or chalky soil contains a lot of calcium carbonate. These soils are usually low in nutrients and are also not able to store water very well, thus making them poorly suited for agriculture. Nevertheless, it is very important for plants to have soil with a balanced pH. This is where chalky lime can help: when lime is mixed into the soil, plant growth can improve since it balances the pH.	Calcareous soils have a lime content of a)10%, b)20% or c)40%	a)10% b)20% <b>c)40%</b>	Level 3/5
Clay soils	Clay soils are known as heavy soils. They are very hard to cultivate to grow plants. Despite being rich in nutrients, they have many disadvantages. Clay soils take longer to warm up than other soils, which is why plants in clay soils develop more slowly in the spring. For this reason, clay soils are also called cold soils. Clay soils are also very dense and allow very little water to get through. This makes it harder for the roots of plants to penetrate into the soil. Before being used for agriculture, clay soils first need to be drained.	Why are clay soils called cold soils?	<b>a)clay soils take longer to warm up during springtime</b> b)clay soils do not warm up	Level 3/1
Loamy soils	Loamy soils are the most valuable arable soils. Not only are they rich in nutrients, but their nutrients also stay in the soil after heavy rains and are not washed away. Loamy soils are also easier to cultivate and do not need to be fertilized as much as other soils, particularly sandy soils. A farmer can consider himself lucky if his land has good loamy soil as it will ensure a high yield and easy cultivation.	What percentage of the buildings worldwide are made out of loam? a)10%, b)30%, c)50%?	a)10% b)30% <b>c)50%</b>	Level 3/9
Peat	Peat is almost like a special kind of soil. It develops in moors and wetlands. Moors are wetlands that have a constant water supply. The plants that grow in moors die off and the plant debris collects on the ground. This turns into peat in a process that takes thousands of years. When it is dried out, peat can be used as fuel. Today, however, peat is usually used for potting soil as it is a good growing medium.	In the 19th century there were even peat-fueled steam locomotives. True or false.	<b>a&gt;true</b> b>false	Level 3/3
Sandy soils	Sandy soils are very easy to cultivate, which is also why they are called light soils. They have both good and bad properties for farming. On the one hand, they warm up quickly, thus making them suitable for planting crops early in the year. On the other hand, they do not store water very well because they are very porous. Nutrients	In Germany around 50% of the soil is sandy soil. True or false?	a>true <b>b&gt;false (20%)</b>	Level 3/7

	also get washed out very quickly. For this reason, it is especially important to fertilize sandy soils in order to have good yields when farming.			
Silty soils	Silty soil is mainly found along coastlines and in river estuaries. Silty soil mainly consists of very fine sand (silty sand), clay, salts, and many organic components such as decaying plant matter. Practically every child in Northern German is familiar with it because silty soil is exposed along the coast for a few hours every day at low tide. In the intertidal zone known as the Wadden Sea, children enjoy playing with this muddy soil. Silty soils can be especially dangerous for ships. Since they are full of water, sonar devices can have a hard time telling them apart from water, meaning that they cannot be recognized as shallow areas. They are not suitable for growing crops. Only marsh plants, which have adapted to partially flooded soils, have a chance here. Before agricultural crops can be grown in silty soils, the land must first be drained. Once that is done, the soil is very rich in nutrients.	Roughly 50% of silty soils consist of sand. True or false?	<b>a)true</b> b>false	Level 3/11

## Solar Energy

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
How solar energy works	When sunbeams hit the Earth's atmosphere, they are largely scattered and reflected due to dust or ice particles. This creates heat that is used in solar thermal systems. However, some (10%) of the rays manage to reach the Earth's surface, where we can use it as a source of energy with the help of photovoltaic technology (solar cells). If a sunbeam hits a solar cell, this activates tiny parts inside the cell that generate electricity. We can then transport and store this electricity so that we can later use it.	Which effects of the sun can we use to generate energy?	<b>a)heat and radiation</b> b)radiation and the speed of light	Level 3/4
The advantages and disadvantages of solar energy - Part1	The most important advantage of solar energy is that it is an inexhaustible source of electricity. Nevertheless, the amount of electricity generated greatly depends on the weather. If it is cloudy, hardly any electricity will be generated. The extent to which installing solar cells makes sense thus greatly depends on the location. Although solar electricity is highly weather-dependent, solar	Which direction must solar panels face in order to generate more energy?	a)North <b>b)South</b>	Level 3/4

	electricity makes users independent from major energy companies. Instead of buying expensive electricity, they can even feed their excess green electricity into the main grid and earn money.			
The advantages and disadvantages of solar energy - Part 2	Unfortunately, photovoltaic systems are still very expensive. Nevertheless, the investment usually pays off after just three years since the benefits will have offset the cost. Yet despite having a long service life and improved effectiveness, solar cells require quite a lot of maintenance. The sunbeams can only be effectively converted into electricity when the surfaces of the reflectors are clean. In addition, storage modules must be purchased when solar systems are installed so that you can still meet your electricity needs even when the sun isn't shining.	How long do you think the service life is for photovoltaic systems?	a)3 years <b>b)20-25 years</b>	Level 3/4
The future of solar energy	In the future we will be able to use solar energy even more effectively, for example with solar-powered cars, boats, or airplanes. Its use on the surfaces of homes and residential buildings will also continue to be expanded. Researchers are developing, for example, transparent solar foils for windows and solar paints with quantum dots, which can be used to turn windows and building facades into permanent solar panels. Yet solar energy can't just be used on Earth, but also in outer space, where it could be used on solar satellites that can capture sunbeams before they are dispersed. Just imagine how much energy we could generate that way!	In the future, solar energy will be part of our everyday life objects because the size of solar panels can be reduced.	<b>a&gt;true</b> b>false	Level 3/4
Solar energy in Germany	After wind power and biogas, solar energy is the third most important source of electricity from renewable energy resources. Whereas solar energy only accounted for 0.1% of electricity in 2002, in 2015 that figure had risen to 7.5%. Over 50,000 people are employed in the solar sector and more than one million residential households have solar cells on their homes. Yet solar energy isn't just good for the economy, but also for the environment. In 2012, solar energy cut down on 18.6 tons of CO2 just in Germany!	Solar energy is the third most important..	a)source of electricity from expandable energy resources in Germany <b>b)source of electricity from renewable energy resources in Germany</b>	Level 3/3

## Space

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Asteroids	Never mix up asteroids with meteoroids and comets because they are different. Comets, for example, are made of dust and ice instead of minerals and rocks like asteroids. Meteoroids can have either composition, but are much smaller than asteroids (diameter of < 1 meter). Asteroids can have a diameter of as much as 1,000 km (approx. 621 miles). They are considered minor planets, remaining particles of shattered would-be planets that orbit in the inner and outer solar system.	Asteroids are composed of...?	<b>a)minerals and rocks</b> b)minerals and ice	Level 1/2
Near-Earth asteroids	Can you believe that as of 2016, there are 14,616 near-Earth asteroids known to man? And this is only a very small fraction of the actual number of asteroids that orbit our planet. As of now, however, there is only one asteroid that has a very high chance of impacting the Earth. It is known as 2010 RF12, and there is a 1 in 16 chance that this asteroid will hit the Earth on September 5, 2095. Since the diameter of the asteroid is only about 7 meters (approx. 23 feet), there would only be minimal impact damage.	How many near-Earth asteroids are there?	a)14,616 <b>b)Millions</b>	Level 1/2
Black holes	Black holes form when a big star runs out of fuel and can no longer support its own weight. Because of all the pressure around it, the star gets smaller and smaller while retaining its mass. Just imagine that instead of holding a 20-pound bucket, you'd have to pick up one 20-pound salt crystal. And now imagine the power of a whole star at the size of an atom or smaller. The gravitational field of black holes is so strong that they pull in everything that is close enough, even light.	Black holes absorb light because of their strong...	<b>a)gravitational pull</b> b)vacuum	Level 1/2
Germans in space	Did you know that Germany was once separated? After World War II the country was split into two parts, which were in a constant power struggle. Both of the German countries wanted to be first to send a German to space. In the end, it was surprising that East Germany, which had a weaker infrastructure, won the German space race when	Which part of separated Germany was the first to send a German into outer space?	<b>a)East Germany</b> b)West Germany	Level1/1o.2

	they sent Sigmund Jähn with the Soyuz 31 mission in 1978. The cosmonaut (the East German name for astronaut) became a legend in Germany and still works with the European Space Agency (ESA) to this day.			
Mars Express	That is the name of a Mars probe on a mission conducted by the European Space Agency (ESA). The probe was put into orbit around Mars in December 2003. Sometimes it flies just 300 km over the surface of the planet. The high resolution stereo camera (HRSC) developed by German scientists in Berlin sends photos with a resolution of up to 10 m from the ground. This allows for three-dimensional images of the surface of Mars to be produced.	What is the size ratio between Mars and Earth? a) Earth is twice as large b) Earth is three times as large	<b>a)Earth is twice as large</b> b)Earth is three times large	Level 1/1o.2
What are the names of the planets in the solar system?	In order to remember the nine planets, there is a helpful sentence in German: Mein Vater erklärt mir jeden Sonntag unsere neun Planeten (My father explains our nine planets to me every Sunday) - Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. An English equivalent is: My very educated mother just showed us nine planets. In German, a memory aid like this is called an Eselsbrücke (a mnemonic device, literally translated as “donkey bridge”). In 2006, the International Astronomical Union (IAU) announced that Pluto is no longer a planet. Now, it is considered a dwarf planet. The main reason for this is that it does not orbit the sun in a circular path.	How many planets orbit the sun? a)10, b)7, c)8	a)10 b)7 <b>c)8</b>	Level 1/1o.2
Space debris	Space debris is what we call junk floating around in space, such as rocket stages, broken satellites, lost equipment, and other fragments. It can quickly lead to collisions and chain reactions! Space debris is man-made, and every spaceship, rocket and satellite contributes to the problem. Even little chunks of debris can be dangerous to important equipment because more than 500,000 pieces of space debris in orbit around Earth travel at speeds up to 17,500 mph - fast enough that every bit poses a serious threat.	Space debris travels at speeds up to a) 17,500 mph b)500,000 mph	<b>a)17,500mph</b> b)500,000 mph	Level 3/7
Space exploration	No country can explore something as large as outer space by itself. That’s why many countries have aerospace institutions that work together on projects and space missions. The institution in Germany is the German Aerospace Center (Deutsche Zentrum für Luft- und	What is the name of the German version of NASA?	a)Max-Planck-Institut <b>b)German Aerospace Center</b>	Level 1/1o.2

	Raumfahrt - DLR). There are also quite a few research facilities such as the Max-Planck-Institut that study outer space for solutions to problems on Earth. The topics studied included renewable energy sources, climate change research, and global infrastructures of the future.			
The speed of light	Did you know that nothing can move faster than light? In his theory of relativity, Albert Einstein, the most famous German physicist, determined that light moves at a speed of 186,000 miles/second. When the speed of light is squared ( $c^2$ ) and multiplied by the mass of a material ( $m$ , found in the periodic table, for example), then you can calculate how much energy this mass has. $E=mc^2$ Einstein thus proved that there can be a lot of energy even in very tiny things.	Who wrote the theory of relativity?	a) <b>Albert Einstein</b> b) Isaac Newton	Level 1/10.2

## Water

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
From a dead body of water to a fish-filled river	In the early 1970s, Germany's largest river, the Rhine, was a dead body of water. All the way from Switzerland to the North Sea, household and industrial wastewater was dumped into the river without being treated. Fertilizers and pesticides from agriculture also ended up in the river. In order to measure how polluted a body of water is, researchers study small living organisms known as bioindicators. Because of their sensitivity to pollution, bioindicators are unable to survive after a body of water reaches a certain level of pollution and will no longer be found in such waters. Through the construction of water treatment plants and the use of phosphate-free detergents, the water quality of the Rhine has significantly improved. Today, over 40 species of fish once again live in the Rhine, including salmon that swim up the entire length of the river to spawn. As a result, the Rhine has once again become appealing for anglers.	How many anglers fish in the Rhine each year?	a) 5,000 b) 15,000 <b>c) 30,000</b>	Level 3/9
The desalination of seawater	Although many countries on Earth have a shoreline, they don't always have a secure water supply. Seawater is not drinking water because it would dry out the body. Many drinking water problems	A seawater desalination plant costs around \$400,000,000. True or	<b>a) true</b> b) false	Level 3/7

	could be solved if the endless supply of seawater could be used as drinking water. In fact, there are now various options for desalinating seawater. The most widespread is the evaporation method. The idea behind this is quite simple: Seawater is heated in large plants. The water rises as steam, cools, and drips into a collection tank. The result is drinking water – without salt since salt does not evaporate and stays at the bottom of the original tank.	false.		
Low-tech desalination with solar energy	Many countries on Earth cannot afford expensive desalination plants to obtain drinking water. Stephan Augustin of Germany wanted to solve this problem when he was on vacation and had the idea for an affordable and ecofriendly solution: the Watercone. The Watercone can be used on a sunny day to obtain the amount of drinking water a child needs per day from saltwater. As the name implies, Watercones are shaped like cones. Solar energy allows the seawater in the cone to evaporate; the steam then condenses into drinking water. Augustin has won design and environmental awards for his invention. In 2008, Kofi Annan, the former General Secretary of the United Nations, presented him with the “Energy Globe.”	How much drinking water does a child need per day? a)1 l, b)1.5 l or c)2 l?	a)1 l <b>b)1.5 l</b> c)2l	Level 3/7
Groundwater	Have you ever gone swimming in a lake? If so, then the water you were swimming in was most likely groundwater. You normally can't see groundwater because it is underground. Sometimes it's only a meter (40 inches) under the surface of the earth, but sometimes it can be up to 50 meters (2,000 inches) underground. Groundwater flows through the hollows spaces that form underground. At the same time, the water is filtered and purified by the various layers of soil and rock. Groundwater is the most important source of drinking water for people around the world.	What percentage of drinking water comes from groundwater? a)100%, b)75%, c)50%?	a)100% <b>b)75%</b> c)50%	Level 3/1
Rivers	Did you know that river water is poorly suited for water collection? Due to their changing environments, rivers are subject to major fluctuations in their water quality. Even the smallest ecological disruptions can influence a river's entire flora and fauna. Typical causes of pollution in rivers include pesticides used in agriculture, chemical waste from industry, or trash that has been thrown into rivers.	If water is used in industry for cooling and is later released back into the river at a higher temperature...	a)the river's biotope will not be affected. <b>b)there will be major changes in the river's biotope.</b>	Level 3/9

Swamplands	Swamps are habitats characterized by standing water. Swamps primarily form in floodplains, which causes their ground to consist mostly of mud. Only marsh plants can grow here since swamp water is very low in oxygen. Swamp water is also not suitable for drinking water because it contains a lot of sediment. Swamplands must be dried out in order to be used for agriculture. In many places around the world, dried out swamps are now being renaturalized.	What is the largest swampland in the United States? a)The Atchafalaya Basin or b)the Okefenokee Swamp in Georgia?	<b>a)the Atchafalaya Basin</b> b)the Okefenokee Swamp in Georgia	Level 3/3
Thermal water	Due to geothermal conditions (e.g., proximity to a volcano), thermal water is groundwater that comes out of the Earth at a temperature of over 20°C (68°F). Around 62% of all so-called hot springs that are not in oceans are in Yellowstone National Park in the United States. Thermal water isn't just hotter than normal groundwater, but also has a higher mineral content. This is why it is often used for health and medicinal purposes. Thermal water can also be used to generate energy. Iceland, for example, generates around 50% of its energy from geothermal sources.	Guess the temperature of the hottest thermal water on Earth (including oceans).	a)237°C (458.6°F) <b>b)400°C (752°F)</b> <b>(The thermal springs in mid-ocean ridges reach temperatures of over 400°C / 752°F)</b>	Level 3/5
Waterfalls	While waterfalls are beautiful, they can also have a major impact on an ecosystem. They are an obstacle, for example, for fish that migrate upriver. Some species of fish (e.g., salmon) have evolved such that they are able to negotiate waterfalls. As a result of the water falling and nebulizing when it hits the surface below, the water in waterfalls is extremely high in oxygen. Nevertheless, the overall water quality depends on the water quality of the river.	Guess how high and far a salmon can jump.	a)0.5 m (1.6 ft.) high and 2 m (6.6 ft.) out <b>b)3 m (9.8 ft.) high and 5 m (16.4 ft.) out</b>	Level 3/11
Water filtration	Did you know that you can build your own water filter with just a few materials? All you need are two clay pots in different sizes, a plastic tube, and sand filters. The tube is guided through a hole in the side of the larger clay pot. Layers of stones and sand (large to fine particles) are then layered on top of each other in the larger pot. The smaller pot is put on top of the larger pot and water flows into the larger pot through a hole in the larger pot and is then filtered by the sand. This type of filter is called a Nadi filter.	A Nadi filter works similarly to filtering water through the layers of the Earth.	<b>a&gt;true</b> b>false	Level 3/12

## Weather

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Lifting mechanisms	The recipe for cloud formation generally includes: water vapor, condensation nuclei, and a way to cool down the water vapor enough so that the water vapor (a gas) condenses into liquid (or solid) water droplets. In nature, this 'cooling' is often achieved by one of four lifting mechanisms - as you move up through the first layer of the atmosphere, the temperature drops. (e.g. as you climb or drive up in elevation, the temperature becomes much cooler) . These lifting mechanisms include: 1. Convective uplift - when cool, dense air sinks under warm air, forcing it up; 2. Orographic lifting - when air (often from a prevailing wind) is forced up over a mountain range; 3. Frontal wedging - when warm air is forced over a layer of cooler air along a front; 4. Convergence - when two streams of air (wind) collide - head-on - and are forced upward	The island you now inhabit has a mountain range that runs north to south and a prevailing global wind pattern that moves air and weather patterns from west to east. Which lifting mechanism would likely have the greatest impact on weather patterns for your island?	a) convective uplift <b>b) orographic lifting</b>	Level 2/1
Weather fronts	Recall that frontal wedging was one of the four main types of lifting mechanisms known to generate clouds and therefore precipitation. A front is a boundary that exists between two masses of air that have dissimilar temperatures and/or humidity. Generally speaking, there are four types of fronts: Cold front: occurs when cold air advances into and under a mass of warm air - forcing the warm air up quickly causing cooling, condensation, and cloud formation. This type of front generally produces shorter bursts of intense precipitation (thunderstorms possible) with a noticeable cooling once the front has passed. Warm front: occurs when warm air advances into and over a mass of cold air - forcing the warm air up gradually causing cooling, condensation, and cloud formation. This type of front generally produces longer lasting gentle showers with warmer temperatures once the front has passed. Stationary front: occurs when a mass of cold air and a mass of warm air are sitting next to one another with neither mass advancing significantly into the other. This type of front generally produces longer lasting overcast conditions with gentle showers until the front moves on. Occluded front: occurs when a cold front catches up to and overtakes a warm front. This			Level 2/1

	type of front produces more intense precipitation. Fronts are often represented as lines with various colors/shapes indicating the type of front on weather maps. The direction that the shapes (half circles or triangles) on the front are 'pointing' indicates the direction that the front is moving. For example, a warm front as shown below would indicate that warm air is moving northwest into a mass of cold air.			
Winds	Winds are created when air moves from an area of higher air pressure to lower air pressure (often produced by temperature variations) - in an attempt to reach equilibrium. Prevailing global wind patterns are caused by an unequal heating of the Earth's surface in conjunction with the Coriolis Effect. For latitudes between 30-60°N on Earth, such as in North America, these prevailing global wind patterns often force weather patterns to move from west to east, because the global winds for these latitudes blow from the southwest to the northeast. Latitudes located in other global wind belts have weather patterns that blow in different directions - as dictated by their own prevailing global wind patterns. For example, Madagascar (which has a latitude ~18°S), has a global wind pattern that forces most of its weather to travel from east to west because their global winds generally move from the southeast toward the northwest between 0 and 30°S latitude.	Assuming that this new island that you've inhabited is located at approximately 32°S latitude and that the global wind patterns are similar to those of planet Earth, in what general direction would you expect the weather to track across your new island home?	a)north to south <b>b)west to east</b>	Level 2/1

## Wind Power

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
How do you turn wind into electricity?	A wind turbine turns kinetic wind power into electric energy with the help of a wind rotor and a power generator. Kinetic energy is a fitting name for wind energy because kinetic comes from a Greek word meaning movement. Yet only 59% of the energy contained in wind can actually be used. Another 14% of the energy is lost in the production process. For example, 5% of the energy is lost due to the mechanical friction of the rotor blade. Did you know that only 45% of wind energy can be converted into electric energy?	More than half of wind energy is lost. True or false.	<b>a&gt;true</b> b>false	Level 3/2

What does a modern wind turbine look like?	In recent decades, wind turbines have rapidly evolved and changed. Wind turbines are an innovative, constantly evolving technology. A modern turbine today has rotors with a diameter of up to 90 meters. The average tower height is between 80 and 130 meters. The improvement in power generation shows how innovative this technical development is. In the last ten years, the height of wind turbines and the diameter of the rotors have doubled. The amount of electricity produced has thus increased ten-fold. Modern wind turbines have three blades, because three is the magic number that maximizes their energy output. With two blades, the wind turbine doesn't catch as much wind as it could with three. With four or more blades, on the other hand, something strange happens. As each giant blade turns in the wind, it disturbs the air around it and creates eddies and wind currents. If the blades are too close together, these wind currents blow against the blades and slow down the whole turbine. If the turbine has exactly three blades, however, the blades are far enough apart that the total drag from the wind currents is less than the extra power gained from the third blade.	Why have wind turbines gotten taller and taller? a) Because more wind blows at higher elevations b) Because the rotor blades have gotten larger and larger	a)because more wind blows at higher elevations <b>b)because the rotor blades have gotten larger and larger</b>	Level 3/2
Wind power in Germany	Despite being a relatively small country, Germany is one of the world's largest producers of wind power in addition to China and the United States. Very few countries in the world have the technical expertise and practical experience in this area that Germany does. German producers of wind turbines have a 20% market share worldwide. Wind power also creates jobs. In 2015, approx. 149,000 people worked in the 26,000 wind turbines that have already been built in Germany. And these figures are expected to grow. Wind energy currently accounts for 40% of Germany's renewable energy sources.	A wind power plant creates more than 5 jobs. True or false.	<b>a)true</b> b)false	Level 3/2
Offshore wind power	Did you know that the German federal government has the goal of reducing greenhouse gas emissions by 80% by 2050? This ambitious goal can only be achieved with wind power. So-called offshore turbines built at sea are especially interesting in this context. The wind is always blowing there! That's why the energy yield is as much as 40% higher than for turbines on land. Offshore turbines are built in so-called wind parks or wind farms that contain many wind turbines	Offshore turbines produce twice as much power as turbines on land. True or false.	a)true <b>b&gt;false</b>	Level 3/2

	next to each other. Many environmental activists criticize that the noise from the rotor blades negatively impacts the habitats of sea birds. Offshore turbines are also more expensive than onshore turbines.			
Wind energy - Is it all great?	Despite the ecological advantages of wind power, this technology certainly also has its disadvantages and draws criticism. Many people find the larger and larger turbines to be anything other than attractive. Many people think that they spoil the landscape and are opposed to building more wind turbines in their communities. Another point of criticism is the costs for the turbines. It was once thought that a wind turbine would only cost money once and would then produce electricity for free for years. Many turbines, however, do not last as long as hoped and have to undergo costly repairs or be completely rebuilt. This increases the costs for electricity from wind power.	There are more than 25,000 wind turbines in Germany. True or false.	<b>a)true</b> b>false	Level 3/1

## Wood

Sub Topic	Description (Text)	Questions in Sub topics (text+image)	Answers	Level No /Sublevel
Wood as a building material	Wood is still one of the most important building materials, for example, for building houses or furniture. Since the production process usually emits little carbon dioxide and wood is a renewable resource that provides natural insulation for homes, building with wood also makes sense from an ecological standpoint. Wooden surfaces have also been proven to have a positive influence on human health. Yet wood isn't just an important building material for residential use. Due to its properties, it continues to be used to make musical instruments and sporting equipment as well as in shipbuilding.	When properly processed, wood can have an ecological advantage over other building materials.	<b>a)true</b> b>false	Level 3/10
Deforestation	Did you know that every second the equivalent of half a football field of rainforest is cut down? In Latin America alone, deforestation, which is done, for example, to harvest raw materials or gain useable land, leads to the loss of 4.3 million hectares (10.6 million acres) of forest each year. At the same time, 15-30% of forest destruction around the world is illegal. As one of the main producers of oxygen	Every year approx. 4.3 million hectares (10.6 acres) of forest are cut down around the world.	a>true <b>b&gt;false</b> (up to 13 million hectares – 32 million acres – are cut down around the world each year, roughly	Level 3/10

	and primary absorbers of carbon dioxide, forests play an essential role in the Earth's ecosystem. Further deforestation on this scale will thus have fatal ecological consequences for our planet.		the size of Greece)	
Wood processing	Since wood has been on Earth longer than humans, there is evidence that the first types of wood processing were done in the Neolithic Period. Since then, many professions have developed around the processing of wood: from jewelry production to bridge construction. One of the world's largest buildings made completely of wood is the Todai-ji Temple in Japan, which is approx. 57.01 m long, 50.47 m wide, and 48.74 m high (187.04 ft. long, 165.58 ft. wide, 159.91 ft. high). The longest wooden bridge constructed for road traffic is in Finland and is 168 m long (551 ft.).	During the Neolithic Period people were already using wood to construct bridges and buildings.	a)true <b>b&gt;false</b>	Level 3/10
Wood species	Did you know that there are more than 30,000 species of trees on Earth? This is why it is extremely difficult to tell all of the different species apart. For this reason, trees are classified more broadly into the categories of hardwoods (deciduous trees) and softwoods (evergreen conifers). These two categories of trees differ in terms of their structure and makeup, characteristics, as well as how they are used. Nevertheless, softwoods are used more often for furniture since they grow faster and straighter.	How many categories of trees are there?	<b>a)2</b> b)approx. 30,000	Level 3/9