Federal Ministry for the
Environment, Nature Conservation
and Nuclear Safety

Umwelt Bundes Amt
for our Environment

ENVIRONMENT AND HEALTH

Educational and Information Materials

Workbook for Pupils
PRIMARY LEVEL

Note: This material was originally published in German and was designed for lessons for 6-12 year old pupils in Germany. It may therefore be necessary in some cases to adapt the worksheets to the situation in the countries where the material is to be used. To this end, the material is available for download free-of-charge on the Federal Environment Ministry's website at www.bmu.de/bildungsservice.

IMPRINT

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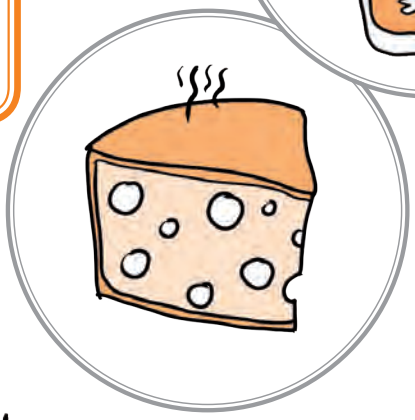
Dear Teachers,

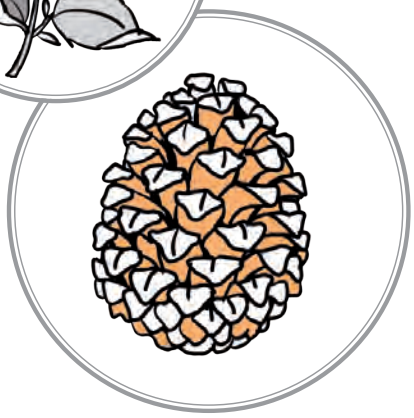
the background information for teachers is available for download at the educational service of the Federal Environment Ministry
www.bmu.de > english > Educational materials > primary level

The Smelling Game

Now it's your turn!

In this game, you are blindfolded and use your sense of smell to identify as accurately as possible what is in the jars. There are two jars of each different scent for you to recognise and put next to each other like in a game of 'Memory'. **Good luck!**

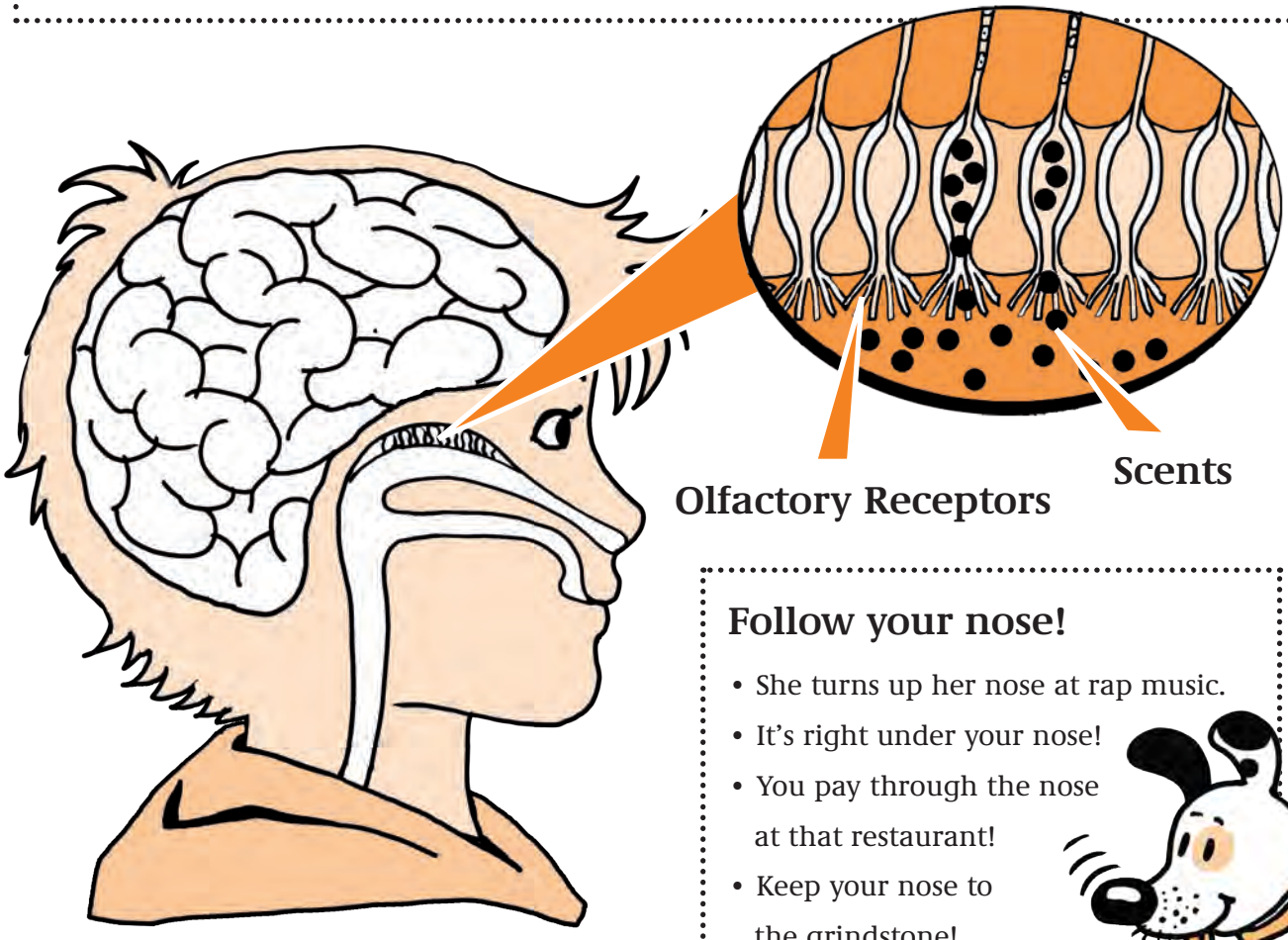




Smell – How does it work?

Your Nose

We use our noses not only to breathe in and out, but also to absorb scents. Our brains then identify the smell. We can smell substances because tiny little particles and gases that are too small for us to see waft through the air and find their way into our noses. There, these scents are absorbed by the mucous membrane. So when we smell something this always means that, at the same time, we are breathing in these little particles.



Follow your nose!

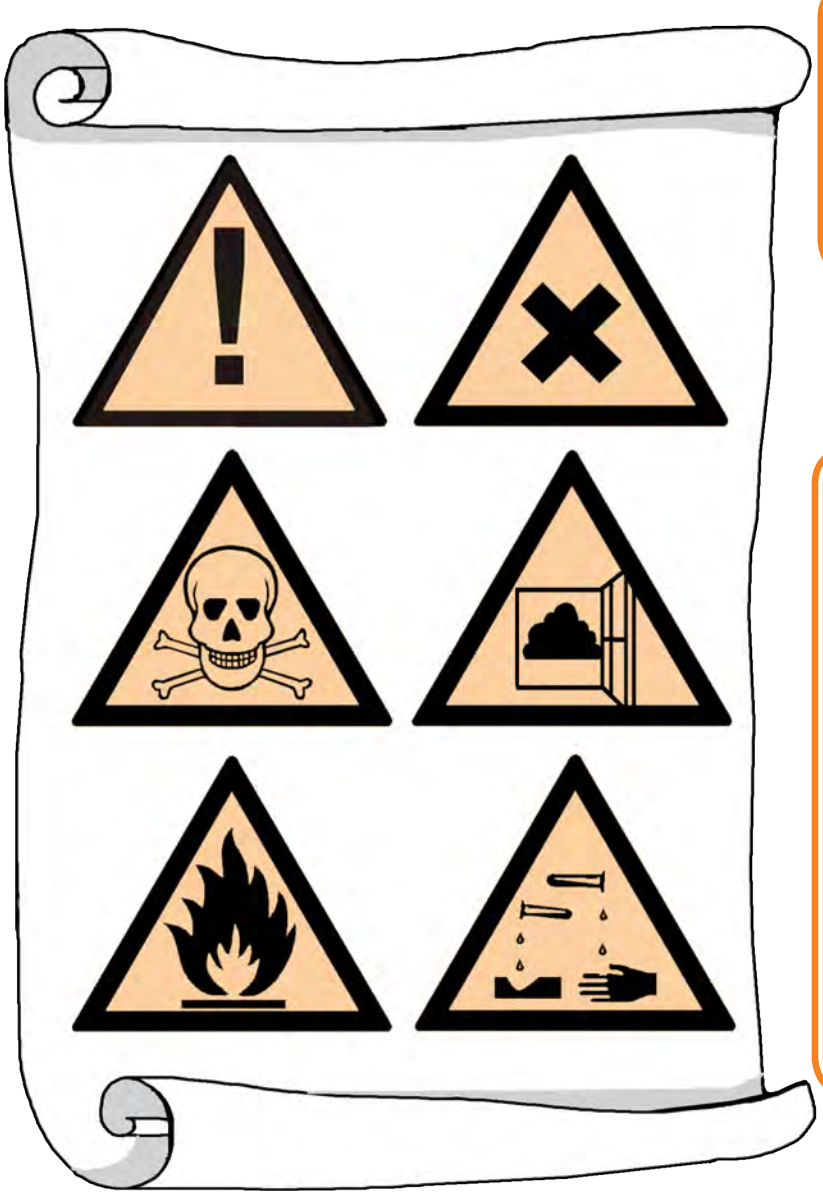
- She turns up her nose at rap music.
- It's right under your nose!
- You pay through the nose at that restaurant!
- Keep your nose to the grindstone!
- Good grades are not to be sniffed at!
- She cut off her nose to spite her face!

Now it's your turn!

1. Do you know these figures of speech? If so, can you explain what they mean?
2. Write down which smells you find particularly pleasant and unpleasant. What do you feel when you smell these things? Compare your lists with those of your classmates.

Redecorating? Watch out!

When we redecorate a room (that means 'to make it look new again'), we often use things that are not completely safe and that smell peculiar. Gloss paint for the windows and radiators, for example, emulsion paint for the inside walls, glue, brush cleaner or solvents to remove paint stains.
Most dangerous substances warn you with their pungent smell; others, however, smell quite pleasant to some people, despite being dangerous, such as the smell of petrol when you visit the petrol station, or the glue you use to make things.



Now it's your turn!

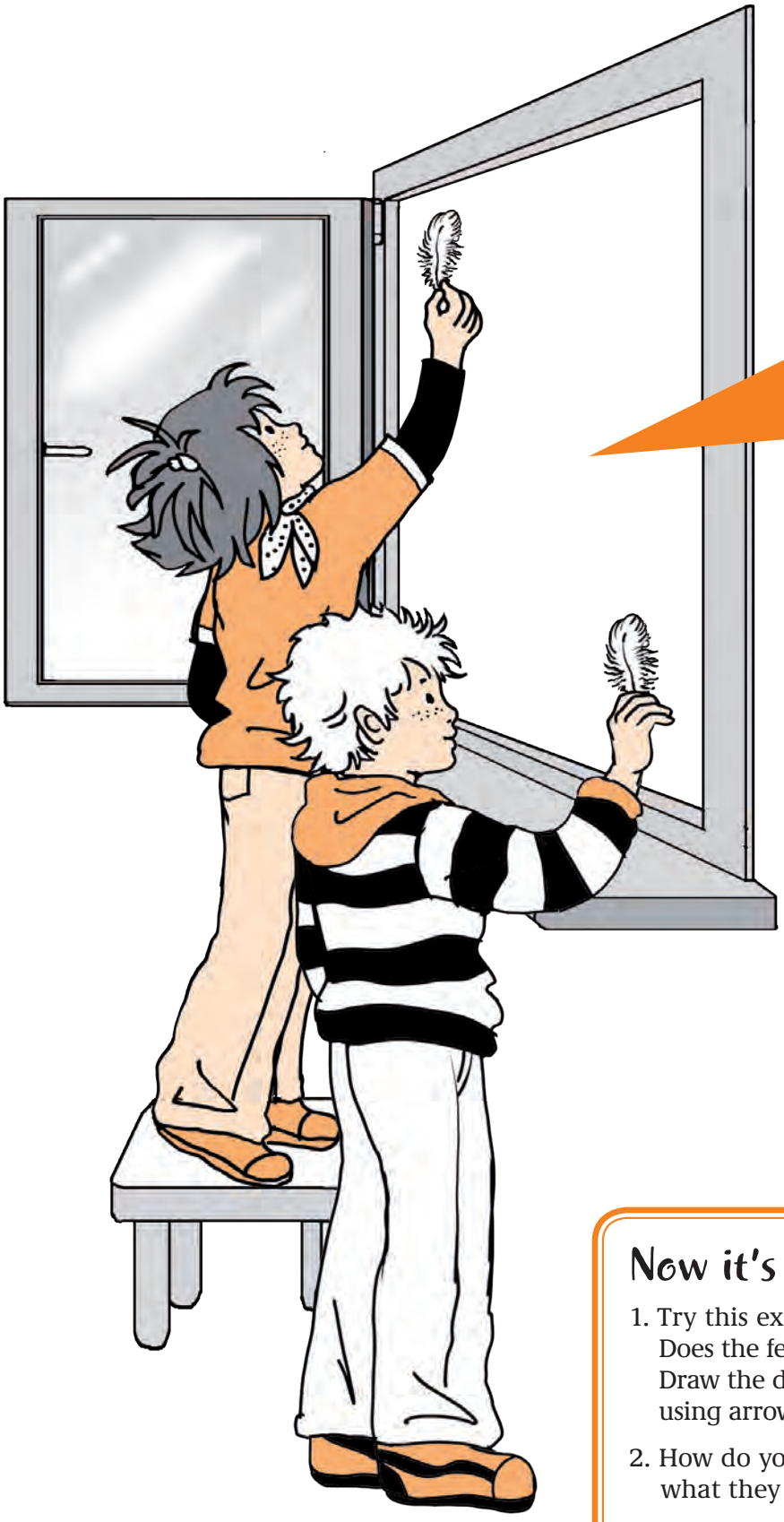
1. Have you seen the warning notices shown here before? If so, where?
2. Do you know what they mean?

Did you know?

Today, there are alternative products for almost all substances that you need to redecorate and which are sometimes damaging to our health and the environment.
Whenever you see this sign (Blue Angel), you can be sure that the product is environmentally friendly. And anything that's good for the environment is also good for your health.

DER BLAUE ENGEL

Going Stale



Stale air makes you tired

When a lot of people sit in a room together, after a while many of them start yawning. Then, at some point, someone will wrench open a window to let in fresh air. **What is actually going on there?**

When we breathe we absorb oxygen and breathe another gas back out again – this other gas is called carbon dioxide.
If there is too much of it in the air of a room, it makes you tired, lethargic and it becomes difficult to concentrate. People say **'It's a bit stuffy in here!'** **The only thing you can do then is to give the room a good airing.**

Now it's your turn!

1. Try this experiment:
   Does the feather point outside or inside the room? Draw the direction of the feather's movement using arrows!
2. How do you air rooms at home? Ask your parents what they know about this topic.
3. When airing the room, why do you have to leave the window open for longer in the summer than in the winter?

What can I hear?

Did you know?

An African proverb says that it is the ears, not the eyes, that see in the dark.

Now it's your turn!

1. Listen carefully to all the noises you can hear for a whole day. Each time you hear something, write down which noise it is and make a note of it in the table on worksheet 6.
2. Which of these noises did you find annoying or irritating?
3. Are any appliances in your home that you find very loud?
   Think about things like toys, the vacuum cleaner or an electric drill.
4. Which noises from outside do you find particularly disturbing?
   What about the sounds made by aeroplanes or road traffic?

The Listening Diary

Time of day and place 	I heard 	I felt 
In the morning		
In the afternoon		
In the evening		

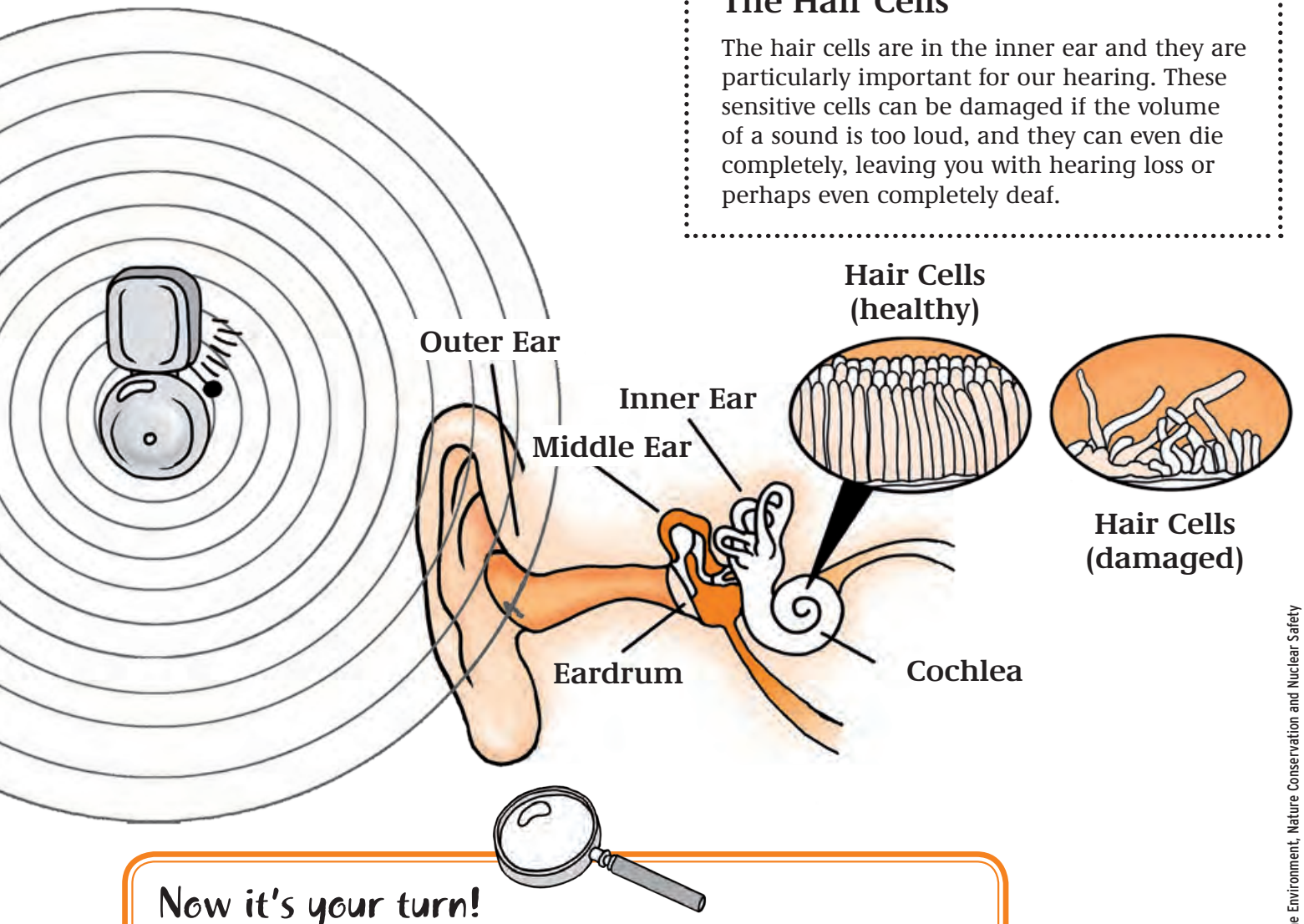
How we hear

Your Ears

Your ears are miracles of nature. The outer ear, or the auricle, collects the sound waves and, like a funnel and sends them down the ear canal to the eardrum. The eardrum is a thin skin membrane. The sound waves make it vibrate. These vibrations are then passed on by various tiny little bones to the inner ear, where they meet the cochlea with the hair cells. These react to the vibrations and send electric signals on to the brain. There, these signals are processed so that we can now hear the sound.
Our ears not only pick up sounds and noises; they also help us to keep our balance.

The Hair Cells

The hair cells are in the inner ear and they are particularly important for our hearing. These sensitive cells can be damaged if the volume of a sound is too loud, and they can even die completely, leaving you with hearing loss or perhaps even completely deaf.



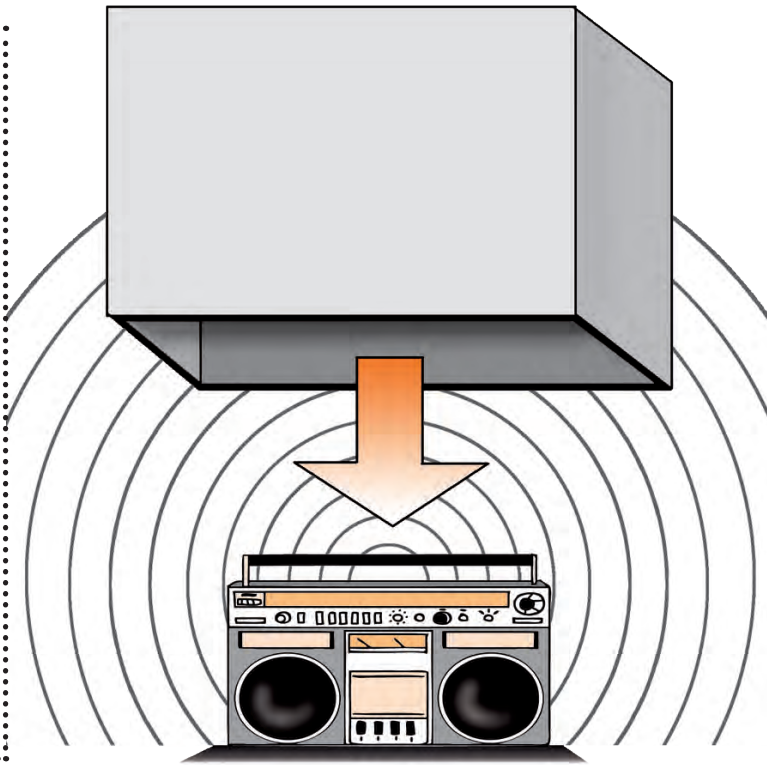
Now it's your turn!

1. What do you know about hearing? What do you know about your ear?
2. Which words in this drawing did you already know?
3. What happens if you listen to music with headphones for too long and with the volume turned up too high? Why can headphones be particularly damaging to your ears?

Put the Noise in a Box!

The Noise Stays Inside!

The thicker and heavier a type of material is, the better it can keep out sounds. This is called **sound insulation**.
So thick walls insulate better than thin walls, and a thick wooden box insulates better than a thin wooden box. The effect is improved if we pack extra material with lots of little hollow spaces in it (like woollen blankets, cushions or felt) into the box. The sound is then partly swallowed by the many little gaps. We call this **sound absorption**.
Musicians use this effect in their rehearsal rooms by covering the walls with special foam.



Now it's your turn!

1. Try out the experiment using different materials. Who has the best ideas for sound insulation and absorption?
2. Assess how good your ideas are, firstly using only your sense of hearing, and then using a sound level meter. Are the results similar?
3. Do you have an idea how sound insulation and absorption might play a part in your daily life?
4. Do you know of any occupations in which noise protection is especially important?

Good Signs and Bad Signs

THE DAILY NEWS

Saturday, 12th July, 2008

How Clean is the Lake?

Warning to Swimmers from Local Health Authority –
Not All Lakes are Suitable for Swimming

The heat of the last few days has been driving many people to the lakes around the city. But not all open water is suitable for swimming. The local health authority is expected to issue a ban on swimming in certain lakes on the city outskirts as of this weekend. *'For their own protection, bathers should also keep an eye out for signs that a lake is or is not suitable for swimming in'*, the local heath authority announced in a recent press release. *'Clear water, surrounded by reeds at the banks, water lilies and a pleasant smell to the water are usually good signs. If the surrounding area around the lake is clean and free of litter, with only little agricultural land around and there are no sewage pipes in sight, then you can assume that the lake is relatively clean.'* Bad signs, the experts warn, include cloudy water (you cannot see your feet when the water reaches your knees), foam at the banks and greenish scum in the water, which suggests algae growth. An unpleasant, sometimes foul smell to the water, swimming dogs and an abundance of waterfowl are further signs of bad water quality. If there is also litter lying around and agricultural land close to the lake, or if sewage pipes are emptied into the water, bathing should be avoided. The authorities therefore recommend: **Keep your eyes open when swimming in open water!** Swimmers can find further details on the information boards near natural swimming sites and by searching in the internet.

Now it's your turn!

1. Read the text of the newspaper article through carefully. Have you heard or read any of these terms before? If so, where?
2. Why do you think that agricultural land such as cultivated fields and meadows are bad for the water quality of a lake?
3. Why should you avoid water in which dogs are swimming and where there is a lot of waterfowl?

How Clean is the Lake?

Now it's your turn!

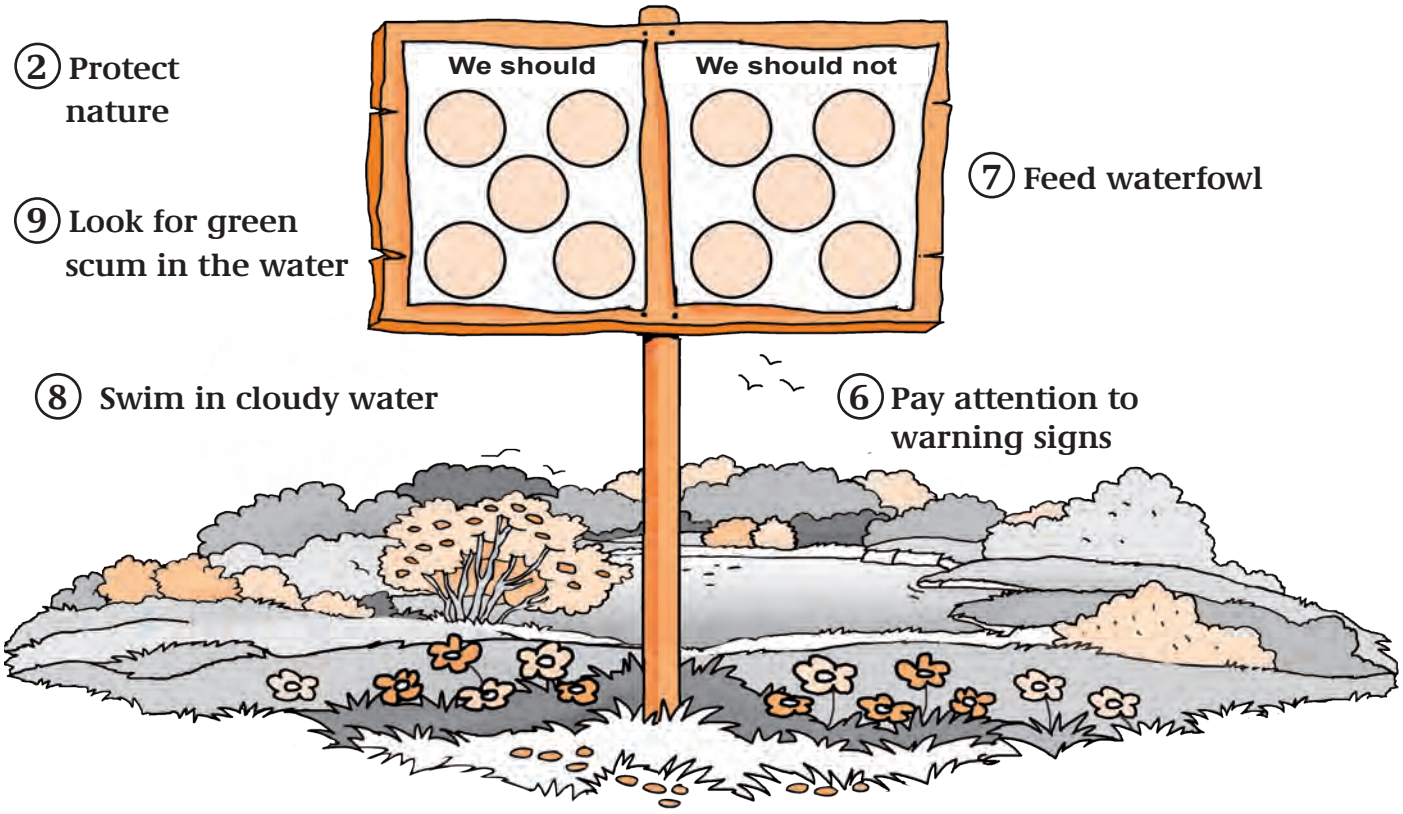
1. Take a good look at both drawings. Tick the good and the bad signs of water quality on the pictures. Give reasons for each of your choices.
2. In which lake would you rather go swimming and which would you avoid? Give reasons for your answer here too.

Golden Rules

② Protect nature

⑨ Look for green scum in the water

⑧ Swim in cloudy water



⑦ Feed waterfowl

⑥ Pay attention to warning signs

④ Allow dogs to swim in the water

⑩ Refrain from walking in the reeds around the lake

① Pee in the water

③ Wash the car at the lake

⑤ Take our rubbish home with us

Did you know?

Wherever you see the **Blue Flag** you can be sure that the water is clean and that the beaches have been cleared of litter. The **Blue Flag** is a sign indicating a clean environment.

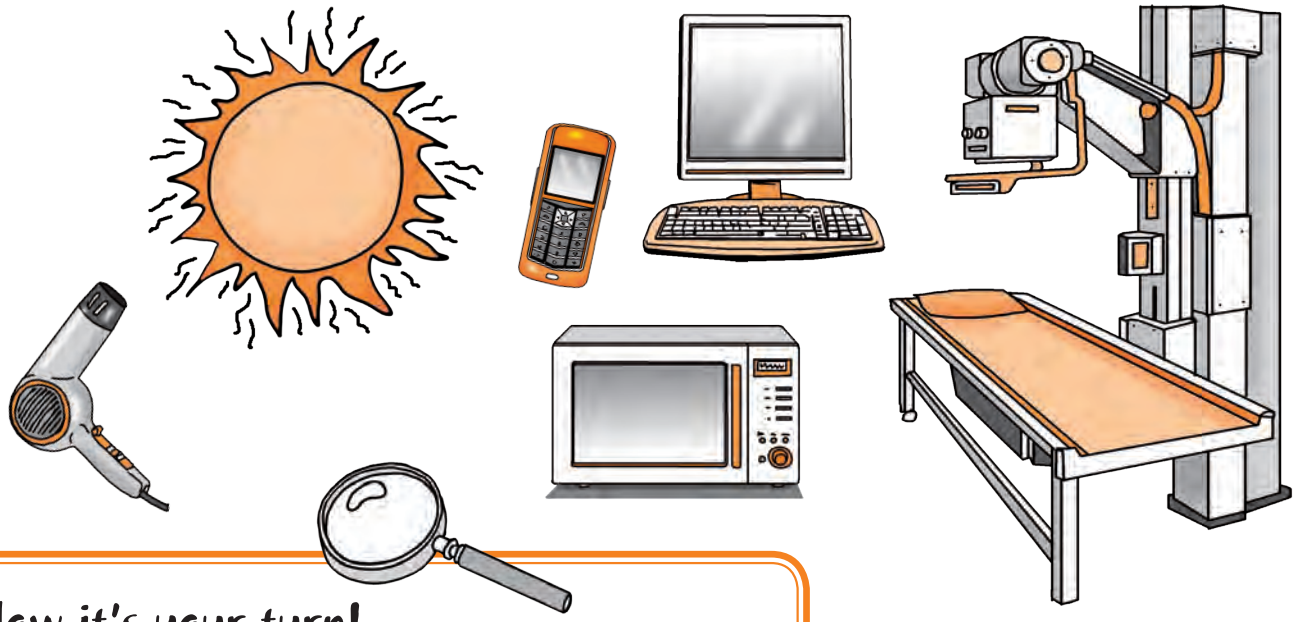
The **'No Swimming'** sign appears in places where water tests have shown that the water might present a health risk to swimmers.

Now it's your turn!

Put each of the actions printed above into the box indicating either what we should or should not do! Write the number for each action in the right circle on the information board!

A Radiant World

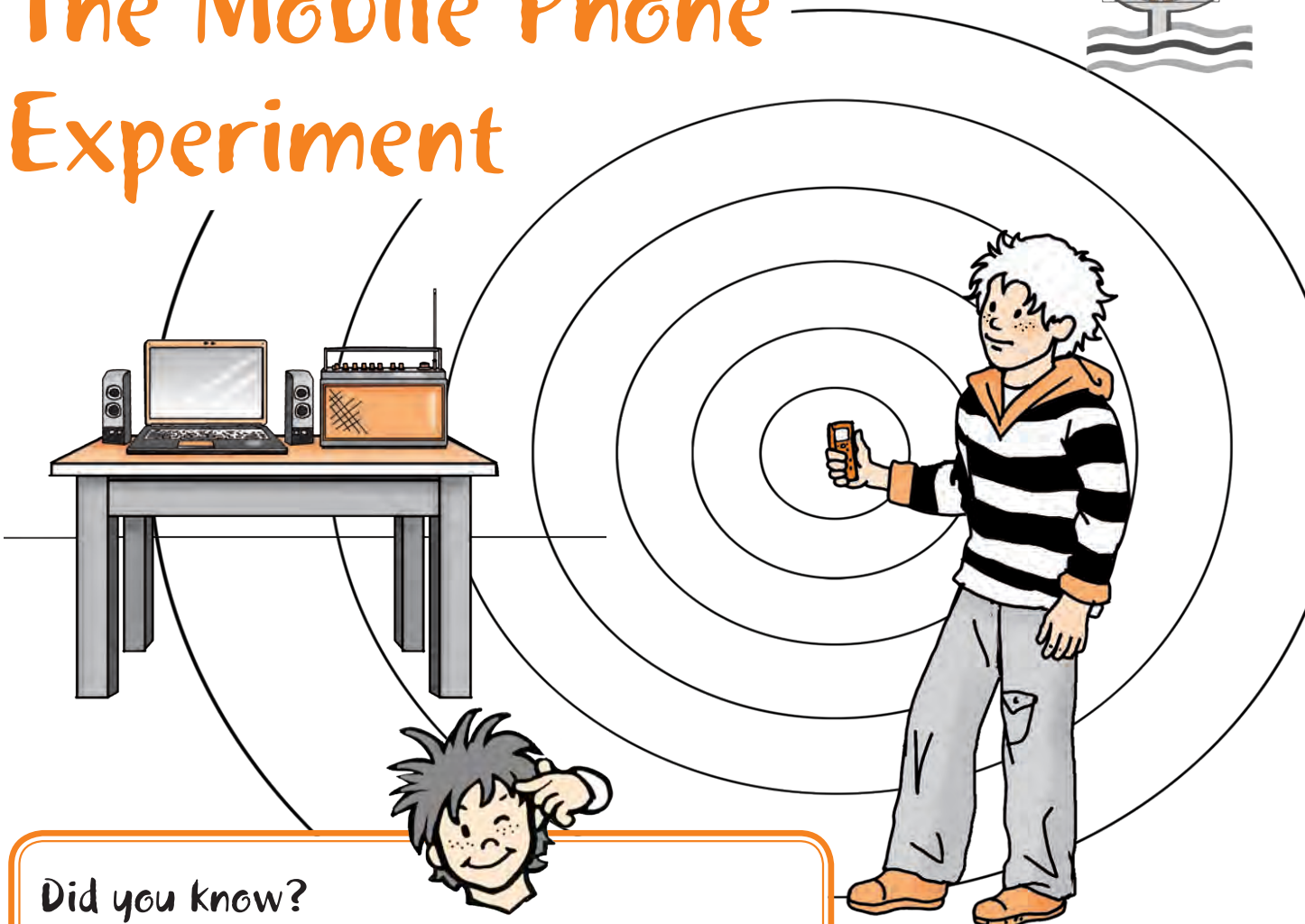
We are surrounded by many kinds of radiation in our everyday lives. Light and warmth from the sun are radiated to the Earth. We can see light, but feel warmth. Another type of radiation is picked up by our radios, televisions or mobile phones. We can neither see nor feel this type of radiation. Some types of radiation, such as the light and warmth from the sun, are of natural origin; others, however, are produced artificially, such as by your mobile phone, radio or electrical household appliances (hairdryers, microwave ovens or electric drills, for instance). Radiation can also be dangerous. It is therefore important to protect yourself from it. Sunscreens or clothing protect you from sunburn and sunglasses protect your eyes. A heavy lead apron protects you when having an X-ray, and members of the fire brigade protect themselves from the heat radiated from fires with heat-proof suits.



Now it's your turn!

1. Here are some items that protect us from radiation. Read the above text carefully and write down which equipment protects from which kind of radiation.
2. Can you think of other things that emit radiation?

The Mobile Phone Experiment



Did you know?

Rules for using a mobile phone:

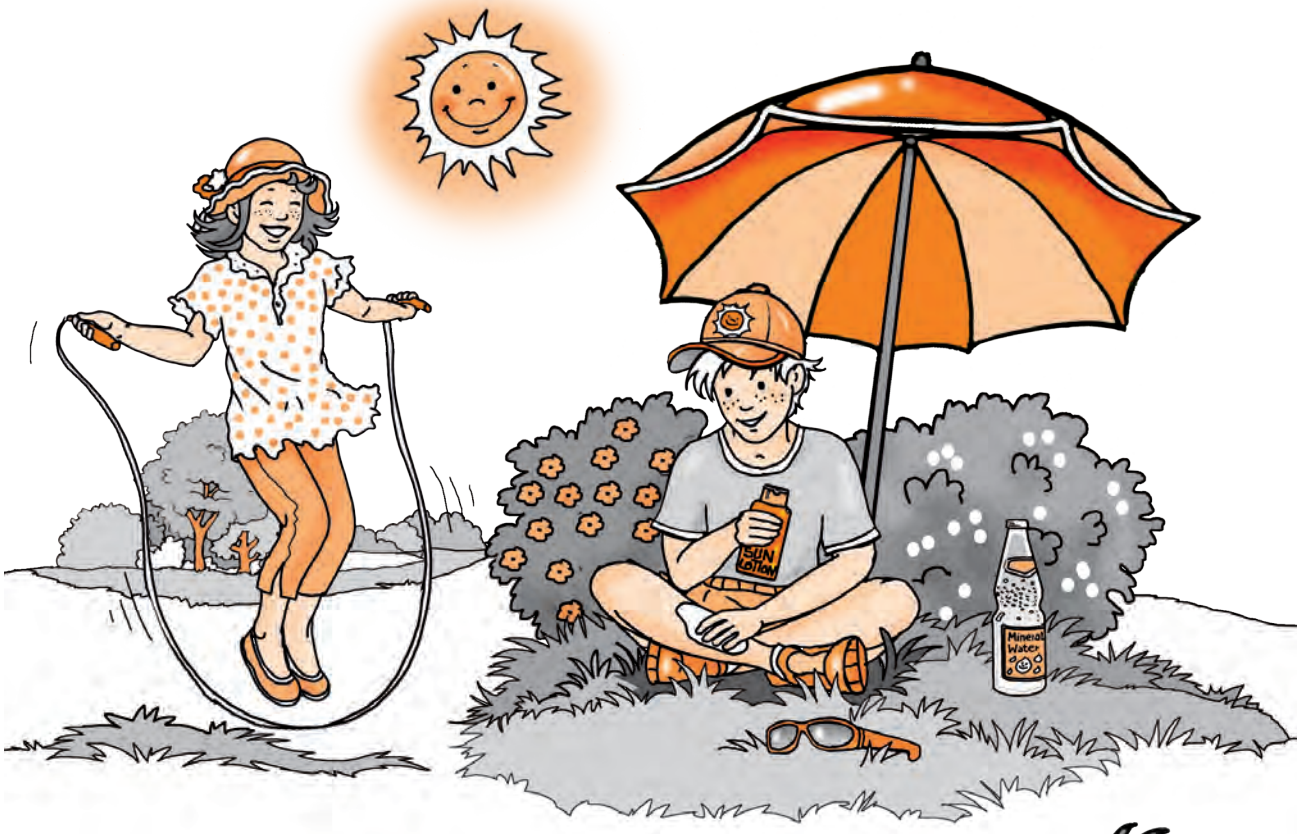
1. Don't put the phone to your ear before you have a connection – when you hear it ringing at the other end.
2. For long conversations use a landline telephone or a headset.
3. Send a text message rather than making a call.
4. As far as possible, try not to speak on the mobile phone where the reception is bad.

Now it's your turn!

1. Try out the four experiments in groups.
   a) Hold the mobile phone next to a radio or computer (with loudspeakers) whilst dialling a number or while someone places a call to you.
   b) Take the mobile phone into a corner of the room and dial a number.
   c) See what happens if someone stands between the mobile phone and the radio (or computer) whilst you are dialling a number.
   d) Go into a neighbouring room or into the school corridor whilst dialling a number.
2. Write down what you observed during each experiment.
3. Why are you not allowed to use a mobile phone in many aeroplanes and in hospitals?

Rays from the Sun

We all love the sun and its warmth, especially when it finally starts to get warm again after the winter. The light and the warmth are good for us. But we must also be careful when spending time in the sun because there is an invisible type of sun radiation called ultraviolet (UV) radiation. UV radiation penetrates our skin without our noticing. Our skin tries to protect itself from the ultraviolet radiation by turning brown. If you skin cannot protect itself enough, however, you will get painfully sunburnt. Wearing a hat and light clothing protects your skin from sunburn. It is also very important to be in the shade around midday, to apply sunscreen to exposed areas of your skin and to protect your eyes with sunglasses.



Did you know?

You should be especially careful if you
- have red or blond hair,
- are prone to sunburn,
- have often been sunburnt,
- have a lot of moles.

Now it's your turn!

Conduct a survey amongst your classmates. You will find a questionnaire for your survey on worksheet 15.

The Sun Protection Reporters

Date: Place: Group/Name:

Make a tally sheet, noting the ages of the classmates you are interviewing and whether they are boys or girls.

5–10 years	10–15 years	Girl	Boy

Questions	Answers		
	Yes	No	Sometimes
Question 1: Do you wear a hat when you are in the summer sun?			
Question 2: Do you wear a t-shirt at the beach or in the outdoor swimming pool in order to protect yourself from the sun?			
Question 3: Do you stay in the shade around midday to protect yourself from the sun?			
Question 4: Do you apply sunscreen when you are in the summer sun?			
Question 5: Do you know what 'sun protection factor' (SPF) on the sunscreen bottle means?			

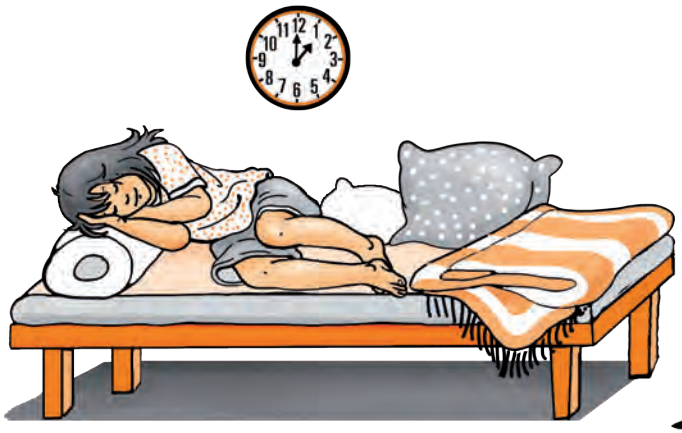
Now it's your turn!

1. You are the Sun Protection Reporters. Carry out the survey in groups of two. Your teacher will explain to you exactly how to do this.
2. What different skin types do you have in your class? How many pupils have each skin type? Your teacher will explain how to find this out.

Getting hotter!

For many people the summer is the most pleasant time of year. We like being outside and enjoying the sun. But we are living in a time in which the climate is changing. It will become warmer and in summer it might get extremely hot. Heat can be a great burden to our bodies.

If it is very hot the body needs to sweat a great deal in order to cool down. It is therefore important to drink enough during hot weather, because our bodies need a lot of fluid. In very hot weather it is also a good idea to spend time in the coolest places available or shady spots.



Did you know?

Five tips for surviving the heat:

1. Wear light, pale-coloured and loose cotton clothing! Make sure you also cover your head and wear sunglasses!
2. Drink a lot, but not ice-cold drinks. Water is best, but tea or fruit juices diluted with water are good, too.
3. Don't exhaust yourself unnecessarily!
4. Stay indoors or at least in the shade around midday!
5. Eat light foods such as soup, salad or fruit.

Now it's your turn!

1. The pictures show people from countries where is has always been hot: Mexico, Spain and Egypt. How do the people in these pictures protect themselves from the heat?
2. Explain why the five tips above make sense in hot weather.
3. Explain in your own words what climate change means. Write your explanation down in your exercise book.

Thunder and Lightning!

Climate change will bring about more frequent extreme weather conditions such as thunderstorms. These storms will more and more often feature very heavy rain and strong winds. The greatest dangers of a storm are lightning and falling trees. Masts and trees can fall down if they are struck by lightning or if the wind is particularly strong during a storm. For this reason you should never stand close to isolated trees or masts. Metal objects such as walking canes or umbrellas can also attract lightning and should be kept at a distance of several metres. You should also avoid open water such as lakes, streams and puddles, which can conduct lightning. If you are in an open area during a storm, you should crouch down and huddle up.

In fields, hollows and low-lying areas provide the best protection. The safest thing to do in a storm is to seek shelter in buildings or in a car, which can also protect you from lightning.

Now it's your turn!

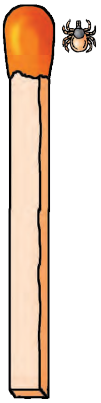
1. You see a flash of lightning and you hear the thunder nine seconds later. How far away is the storm?
2. What risks does a storm present and how can we protect ourselves?
3. Where should you seek shelter in a storm and what should you avoid? What can you do if there is no shelter nearby?

Did you know?

You can calculate how far away the storm is from the number of seconds that pass between the flash of lightning and hearing the thunder. Three seconds indicate one kilometre (1.62 miles).

Have a Good Look!

Ticks are tiny little creatures that suck out our blood. They are not insects, but belong to the arachnids, which are small animals with eight legs, such as spiders. Insects have only six legs. You can find ticks in woods, fields, parks and gardens. They wait on grasses and long stalks for a person or animal to walks past and brush against them. Then they slip off the stalk onto the passing person or animal. Ticks do not 'bite' like mosquitoes; they usually crawl around on your body for a while, looking for a particularly suitable area of skin that they then bury themselves into. There, ticks suck out your blood in order to feed on it, and in doing so they grow up to 100 times their original size! When sucking on your blood, ticks can pass on dangerous diseases. So, when you have finished playing or exercising outside you should examine your skin and clothes for ticks and then remove any you find.
If you find that a tick has already buried itself in your skin, you should visit a doctor, just to be on the safe side.



Did you know?

Ticks prefer body parts where the skin is thinner and warmer, such as between your legs, in the backs of your knees, under your arms, on the back of your neck, behind your ears and at the roots of your hair. Do not remove ticks with your fingernails!

Because of raised temperatures due to climate change, ticks are becoming more and more common, and are often even active in winter! They are also appearing in regions where they were not found before, such as in mountainous areas.

Now it's your turn!

1. Your class is planning an outing. Discuss how you will protect yourselves from ticks and make notes on the results of your discussion.
2. Which areas of your body should you check particularly carefully for ticks?
3. **True or false?** a) Ticks are larger after they have sucked out some of your blood. b) Ticks have six legs. c) Climate change is good for ticks. d) You should remove ticks with your fingernails. e) Ticks only live in the woods.

Ragweed Alarm!

Some plants, ragweed for example, can cause severe allergies. Ragweed originates in America and was introduced to Europe by humans. This plant can spread easily in Europe too nowadays due to raised temperatures through climate change. Ragweed likes a mild climate. It is the tiny pollen of the ragweed plant that can cause severe allergies and even asthma. The surface of the whole plant can also cause allergies if it comes into contact with your skin. The leaves look similar to those of another plant, mugwort, whose pollen is also responsible for some allergies.

Ragweed

Did you know?

If you find some ragweed you should be very careful and be sure not to touch the plant. The best thing to do is not get too close to it. Report your find to an adult who will then be able to inform the local authorities, such as the Environment Office or the town hall.

Now it's your turn!

1. Which plants do you know that cause allergies?
2. What should you do and what should you avoid if you find ragweed?
3. Find out about other plants that can cause allergies such as birch, common hazel, poplar or rye (ask adults or look in books or on the internet). Which parts of the plants are responsible for the allergies and which problems are experienced by people who react to them? What do these plants look like, where do they grow, and at what time of year do they usually cause allergic reactions?

Warning – Chemicals!

We use lots of artificially produced chemicals at home, like cleaning fluids, care products and other substances. Unfortunately these products are not always completely safe, and we have to be careful when using them. They damage the environment when they are flushed away into the waste water system, for example. But they can also affect our health, irritating our skin, eyes and mucous membranes, or by encouraging the development of allergies.

Watch out!

1. Do not mix with other products.
2. Toxic substance.
3. Wash and dry hands after use.
4. Store out of reach of children.
5. Always store product in original container.
6. This product can affect your health.
7. This product is highly flammable.
8. Avoid eye contact. If it gets in your eyes, wash eyes thoroughly with water.
9. Avoid long periods of contact with sensitive or damaged skin.
10. Do not swallow. If swallowed, seek medical advice!
11. This product poisons the environment.
12. Air room after use.

Now it's your turn!

Have a close look at these warnings. You will find them on bottles and other containers in your household. Allocate the warnings and rules for use to the correct symbols and the numbers to the correct pictures.

Start

Finish

Action Cards
Living Room

W

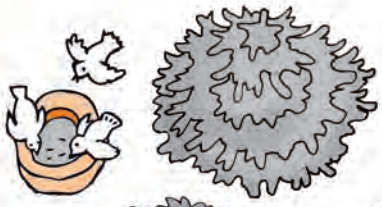
LR

LR

LR

Household
The

Which is correct?
1. This substance is highly flammable!
2. No campfires allowed here!



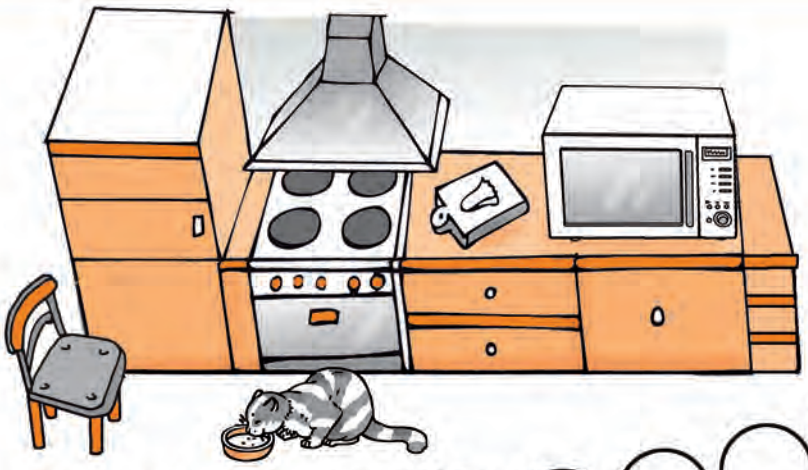
Action Cards
Garden/Cellar

GK

GC

GC

GC



Chemicals Game

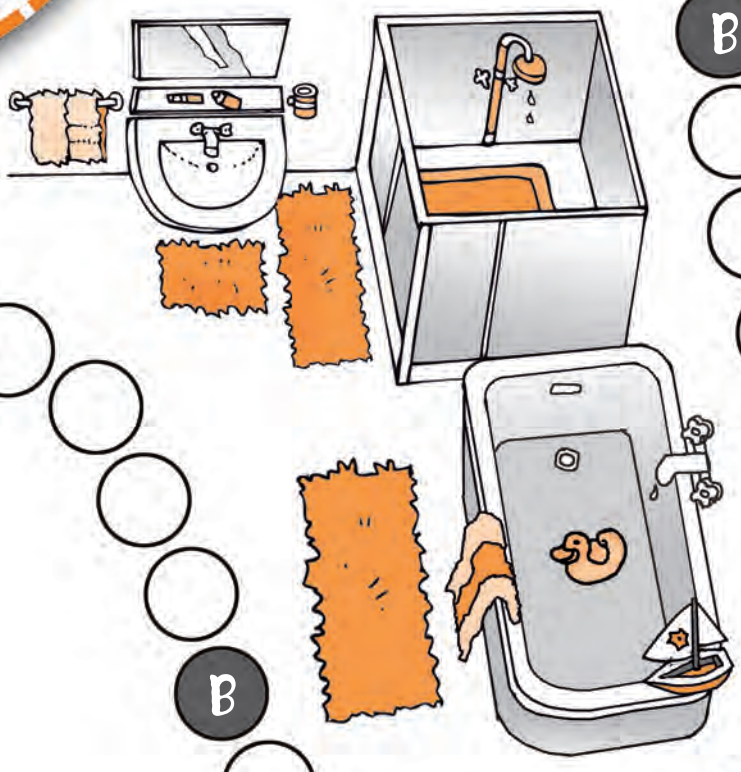
Action Cards
Kitchen

K

Which is correct?
1. Toxic substance!
2. Pirates live here.

Action Cards
Bathroom

B



Which is correct?
1. This substance poisons the environment!!
2. No fishing!

Which is correct?
1. Railway crossing!
2. This substance can affect your health!

The Action Cards

Living Room Section

The living room is supposed to smell nice. You convince your parents to abandon their oil burner with toxic lamp oil and to air the room regularly instead CORRECT!
Move forward 2 spaces. LR

Your little brother has made a mess on the carpet. You go to fetch the carpet cleaner spray for your mother.
WRONG!
She tries it with pure water first.
Go back 3 spaces. LR

There is a lot of dust on top of the living room cupboard. What should you use?

a) Chemical furniture polish
b) A damp cloth LR

Bathroom Section

Your big brother wants to have a bath, but the bathtub is dirty. You tell him to use bathroom cleaner spray.
WRONG! Water mixed with a little citric acid helps too, and is much better for the environment.
Go back 3 spaces. B

The bathroom basin is blocked and your sister wants to unblock it with pipe-cleaning chemicals. You recommend her to use the plunger.
CORRECT!
Move forward 2 spaces. B

It doesn't smell so great in the bathroom. What should you do to get rid of the smell?

a) Spray some air freshener
b) Air the bathroom for 5 minutes B

Kitchen Section

The kettle is full of limescale. You tell your older sister to use citric acid in water rather than the dangerous descaling fluid.
CORRECT!
Move forward 2 spaces. K

It is summer time and there are a lot of small fruit flies in the kitchen. Fruit flies are best treated with:
a) Toxic fly spray
b) A bowl of vinegar in water and by keeping sensitive fruit in the refrigerator K

The cooker got dirty while you were making pizza at a birthday party. You know that oven cleaner is quite damaging to your health, and that it would be better to scrub the oven with hot water and washing-up liquid.
CORRECT! **Move forward 2 spaces.** K

Garden/Cellar Section

There are aphids (small bugs) on the garden roses again. The best thing to use is:

a) Toxic insecticide
b) Home-made nettle spray GC

You are at the DIY shop with your father, who wants to varnish the fence. He wants to take the cheaper varnish, which contains solvents. WRONG!
The environmentally friendly varnish without solvents would be better.
Go back 3 spaces. GC

The old cupboard with the winter clothing is put in the cellar and must be moth-free. You fetch some slices of cedar wood and lavender. CORRECT!
You have no desire to use toxic mothballs.
Move forward 2 spaces. GC

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„Mindful also of its responsibility toward future generations, the state shall protect the natural fondations of life …“

Basic Law for the Federal Republic of Germany, Article 20a

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