



WORKING
TOGETHER TO
INSPIRE AND
EMPOWER
PEOPLE



THE FOOD CONNECTION

How changing what we eat
can help the natural world

FOCUS ON BIODIVERSITY



The word biodiversity is made by joining two words - 'biological' and 'diversity'. It is used to describe links and variety between all living things, including ourselves.

OVERVIEW

The pupils you teach will probably be aware of some of the threats faced by our precious planet. Today, our shared environment faces its biggest challenges ever, but it's important to remind children that we can all do something about this. This resource offers pupils the opportunity to learn about biodiversity through one of the most precious resources that our planet gives us – food.

No species can survive alone and we are all connected in an intricate web of life. Bees, which pollinate our crops are responsible for one in three mouthfuls of our food.

We depend on the millions of species that share our earth. This biodiversity provides us with all we need: the air we breathe, the food we eat, the water we drink, the medicines that protect us and the raw materials we use to build our houses, our clothes and everything that we have. We can all marvel at the beauty of nature and how it makes us happy to be alive.

But too often we forget that unless we use what the earth gives us wisely, we risk losing all we have. Today, about 60% of the Earth's surface is used in agriculture and food production. But the way we produce our food is the biggest cause of biodiversity loss in our world. That's because our Western diet is high in meat, dairy and heavily processed foods. These use up huge amounts of land, water and energy. We are relying on fewer and fewer varieties of crop which are grown on huge plantations. Our ways of farming upset the delicate balance of our ecosystems and, as precious species are lost, we risk the future of our planet.



This resource contains a range of engaging activities that give 7 – 11 year olds the opportunity to explore the issues of food and biodiversity. Most importantly, they will reflect on the positive steps that they can take to eat in a way that is healthy for them and healthy for the planet.

'The Food Connection' has been produced as part of WWF's Green Ambassadors 'Plant2Plate' campaign, which offers a host of resources and activities to develop pupils' knowledge and skills around the topic of food and to develop an interest in growing and cooking their own food. You will find plenty of background information here: wwf.org.uk/plant2plateresources



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CURRICULUM LINKS

England KS2

Design and Technology

Cooking and nutrition; **Science** Plants, animals including humans, living things and their habitats;

Geography Locational knowledge, human and physical geography;

Mathematics Statistics, using information presented in graphs

Northern Ireland KS2

Curriculum objectives Personal health, citizenship, education for sustainable development;

The World Around Us

Interdependence, place, change over time, movement and energy;

Personal and Mutual Understanding; Mathematics and Numeracy Handling data

Scotland Curriculum for Excellence P4-P7

Sciences Planet Earth -

Biodiversity and interdependence, energy sources and sustainability;

Social Studies People, place and environment; **Health and Wellbeing** Food and health;

Technologies Food; **Numeracy** Data and analysis

Wales KS2

Geography Locating places, environments and patterns, understanding places, environments and processes; **Science**

Interdependence, the sustainable Earth; **Personal and Social Education**

Active citizenship, health and emotional wellbeing, sustainable development and global citizenship; **Mathematics** Using data skills



A web of consequences: pupils compare issues of biodiversity in two parts of the world, making links to how a change in our eating habits can help our planet.



Close to home: biodiversity in the school grounds: an investigation into the biodiversity of the school environment which leads on to thinking about the factors that affect this. There are plenty of exciting ways to take this further.



The Big Apple: an apple tasting activity underlines the value of biodiversity and pupils go on to consider growing their own fruit.



Know and grow potatoes: pupils get to know their own potato, carry out a quiz, and then get creative encouraging others to grow their own food.



Play for the planet: there's everything to play for in this activity as pupils come face to face with the threats that face our planet and what we can all do about them.



© Greg Aynfield/WWF-UK



A WEB OF CONSEQUENCES

OVERVIEW

Pupils explore the topic of biodiversity by looking at two areas affected by our food production systems. They will look at the consequences of this and reflect on how different food choices could protect the environment.

OBJECTIVES

- Learn more about the link between how our food is grown and biodiversity
- Encourage pupils to explore how we can make informed choices about the food we eat

WHAT YOU NEED

- One copy of the Amazon or the Doñana card sheet and a large sheet of paper for each pair of pupils
- Glue and pens
- 'WWF Livewell principles' resource sheet
- WWF/Sodexo 'Green and lean meals' animation film – first part of the film up to 1.28min <https://www.youtube.com/watch?v=2HAoqmp8vGo&t=2s>

GET GOING

Write down the word 'biodiversity' and ask pupils to suggest what it means. Note down all ideas. Explain that the card sheets give information on how biodiversity is under threat in two parts of the world. Give each pair of pupils a card sheet, asking them to cut out each box. Taking the 'Start' box first, pupils then arrange the boxes on the paper in a way that shows causes and interconnecting issues. Once they are happy with the arrangement they should glue the boxes down and draw arrows to show links. They could also write their own comments or add further boxes. The Plant, Animal and People boxes should also be added. Now ask pupils to join with a pair working on a different case study and discuss their findings. Are similar issues raised? Were pupils surprised by what they found out?

Did you know that in the Amazon rainforest, a single tree can provide a home for up to 2,000 species of birds, insects, fungi and other living species?



Come back together as a class and discuss ways in which we are affected by these issues. How important is it that we, as consumers, are aware of them? What do they feel that they can do? Highlight how the food choices that we make have a huge effect on our own health and that of our planet. Show pupils the animation film and look at the Livewell principles. Ask pupils, in pairs, to think of one healthy choice for the planet that they can make over the coming week. Encourage them to reflect on this discussion through the week, and support each other in carrying out their actions.

CARD SHEET: THE AMAZON RAINFOREST

START

The Amazon rainforest is often called the 'lungs of the planet'. We all depend on it. The trees and plants that grow here provide more than 20% of the world's oxygen. Rainforests also add water to the atmosphere and this moisture travels around the world.



Trees are cut down so that huge areas of land can be used to farm cattle. In the last 50 years, 17% of the forest has been lost.

When cattle digest grass they produce methane which is another powerful greenhouse gas.

When the rainforest is cut down, large quantities of carbon dioxide and other greenhouse gases are released.

When trees and plants die, topsoil is uncovered and rain washes it away. Without this richest layer of the soil little can grow.

When the rainforest is cut down, there is less rain which sometimes leads to drought.

As soil is washed down into rivers fish die as water is contaminated and filled with silt.

Greenhouse gases cause climate change.

When the rainforest is cut down, animals lose their habitats. A tenth of all species live in the Amazon.

PLANTS

There are 40,000 species of plant that grow in the Amazon. Many of these provide medicines. For example, 70% of the plants that can be used to treat cancer are only found in tropical rainforests.



ANIMALS

The Amazon is home to an amazing 3,000 species of freshwater fish and 427 mammals, including the jaguar. About one in ten species that we know about live in the Amazon and probably lots more that we don't.



PEOPLE

Some 34 million people, including 385 indigenous peoples, call the rainforest home. The forest provides them with food, shelter, medicines and clothing.



CARD SHEET: THE DOÑANA NATIONAL PARK IN SOUTH-WEST SPAIN

START

The Doñana national park is one of the most important places in Europe for biodiversity. This area of wetland is vital for hundreds of species of birds which need to rest here as they migrate to and from Africa.



The Doñana is located in Spain's biggest strawberry-growing region. Spain is one of the biggest exporters of strawberries in the world and people want strawberries all year round.

Water for strawberry plants is being taken from the Doñana. This means that water levels are going down.

Pesticides and the plastic tents used to grow strawberries cause pollution.

Producing strawberries for sale in winter is very profitable.

As water is drained from the Doñana, the habitat of animals that live there is destroyed.

About 50,000 people look after the strawberries. More people puts more pressure on wildlife.

Strawberry plants need lots of water.

As water is drained from the Doñana, the wetlands are facing drought.

There are plans to expand the number of tourists visiting this part of Spain. New hotels and golf courses will use up more precious water.

PLANTS

There are 850 different plant species in the Doñana, and the trees provide important nesting areas for birds.



ANIMALS

Many of our favourite birds including house martins, swallows and cuckoos depend on the Doñana as they migrate. About 6 million birds pass through the park each year. Rare species such as the Spanish Imperial eagle and the highly endangered Iberian lynx find protection here.



PEOPLE

Very few people live in the Doñana. As a world centre for conservation it is very important that the area is kept unspoilt.



RESOURCE SHEET: WWF'S LIVEWELL PRINCIPLES



EAT MORE PLANTS

Enjoy vegetables, fruits and whole grains.

EAT A VARIETY OF FOODS

Have a colourful plate!



WASTE LESS FOOD

One third of our food is lost or wasted.



EAT FEWER FOODS HIGH IN FAT, SALT AND SUGAR

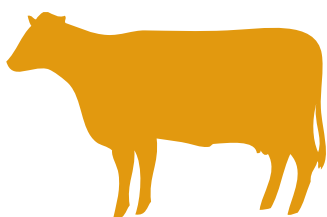
Keep sweet and salty foods for occasional treats.

BUY FOOD THAT MEETS A CREDIBLE CERTIFIED STANDARD

Consider MSC, free-range and fair trade.

MODERATE YOUR MEAT CONSUMPTION

Try other sources of proteins such as peas, beans and nuts.



MSC stands for 'Marine Stewardship Council'. This logo means that the fish you buy was caught in a way that maintains fish stocks and protects the marine environment.



Free range means that the meat and eggs you eat come from animals that have been raised outdoors, at least some of the time.



Fair trade means that workers have received a fair amount of money for their products and worked in safe conditions.



CLOSE TO HOME - BIODIVERSITY IN THE SCHOOL GROUNDS



OVERVIEW

In this activity pupils build their understanding of what biodiversity means, and design their own surveys to investigate the biodiversity within the school grounds. They then consider the factors that might encourage wildlife and also ways to contribute to wider investigations for example through citizen science projects.

OBJECTIVES

- Explore how species diversity is dependent on habitat characteristics
- Consider ways to increase biodiversity in the school grounds

WHAT YOU NEED

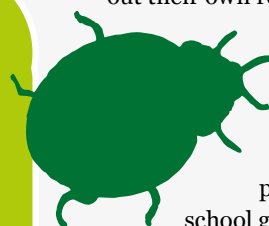
- Clipboards, paper and pens
- A survey sheet or checklist drawn up with pupils
- Quadrants or transects, if using
- One copy of the 'Spotter Sheet' for each pupil

GET GOING

A 2016 report¹ noted that the UK was one of the most nature-depleted countries in the world. Farmland covers over three-quarters of the land but intensive farming methods have taken their toll on biodiversity as hedgerows have been cut down to plant bigger fields. The widespread use of fertilisers and pesticides causes pollution, and soil erosion means that rain carries away the most organic, nutrient-rich layers of topsoil.

As preparation for this lesson, introduce the issue of biodiversity in the UK using the points above. Alternatively, invite pupils to carry out their own research into the importance of our hedgerows online.

Hedgerows are a vital habitat for butterflies and moths, farmland birds, bats and dormice. Over 600 plant species, 1500 insects, 65 birds and 20 mammals have been recorded at some time living or feeding in hedgerows².



Discuss with pupils the habitats in the school grounds – the grassy playing field, the playground, the hedges, the school gardens, and possibly a pond.





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ACTIVITY
2



Agree how you wish to carry out a survey looking at the biodiversity in different habitats in the school grounds. Draw up a survey sheet or checklist and get pupils into small groups to do the survey. With older pupils you could use quadrants and transects. Remind them that if they want to see or hear wildlife they need to be quiet. Encourage them to look up in trees, behind bushes and under rocks or logs – taking care to be gentle and leave things just as they find them.

Pupils should record their findings with tick lists, drawings or photos. Come back together and discuss which habitat contained more species. Why might this be the case? As a next step, think about ways in which biodiversity could be encouraged in the school grounds.

WANT TO GO FURTHER?

Why not get pupils to take part in citizen science projects and contribute to scientific research? Here are some to get you going:

Opal Explore Nature has a wide range of surveys for schools and families, from counting bugs to watching clouds. opal.explorenature.org

The Natural History Museum invites schools and individuals to help scientists collect many types of data. nhm.ac.uk/take-part/citizen-science.html

Discover more about the natural environment and help scientists with Earthworm Watch. earthwormwatch.org

Contribute to a world-wide community with inaturalist.org/



The Green Ambassador, Leafy, is a nature and environment expert. Leafy has plenty of ideas on how to increase biodiversity in your school grounds. You could feed wildlife, plant a wildflower area, sensory garden or butterfly border or make a hedgehog home.



HOW ABOUT

A bug hotel

http://greenambassadors.org.uk/wp-content/uploads/2016/10/Bug_Hotel_Activity.pdf

A bee hotel

http://greenambassadors.org.uk/wp-content/uploads/2016/09/Bee_Hotel.pdf



SPOTTER SHEET: 1

See how many amazing animals you can identify using our wildlife spotter sheet. You can tick them off as you go to help you remember what you've seen.

BIRDS



Chaffinch



Robin



Woodpigeon



Blackbird



Great tit



Swallow



Wren



Nightingale

MAMMALS



Fox



Rabbit



Hare



Grey squirrel



Hedgehog



Badger



Mole

SPOTTER SHEET: 2

INSECTS



© Fritz Polking/WWF

Dragonfly



© Chris Marrin/WWF-Canon

Ladybird



Woodlouse



Cricket



© Global Warming Images/WWF-Canon

Painted lady butterfly



Spider



© Global Warming Images/WWF-Canon

Bee



© Wild Wonders of Europe/Niall Benvie/WWF

Stag beetle

AMPHIBIANS / REPTILES



© David Lawson/WWF-UK

Common frog



Smooth newt



Common toad



© Anton Vorauer/WWF-Canon

Grass snake



© Adobe Stock



THE BIG APPLE



OVERVIEW

In this activity pupils carry out an apple tasting and reflect on the loss of biodiversity in apples, our most popular fruit. They consider the benefits of traditional orchards to a healthy ecosystem.

OBJECTIVES

- Develop understanding of the biodiversity of foods and how this helps the environment
- Consider the benefits of biodiversity to the local community

GET GOING

Get everyone to try a piece of each type of apple, noting down their favourite. How would they describe the different tastes and textures of the apples? Fill in the graph to find the most popular apple. Did pupils enjoy the variety of tastes? Was there a clear winner?

Our climate is ideal for growing apples and in the past, most towns and villages were surrounded by orchards. But our reliance on cheaper, imported apples means that traditional orchards are now much rarer. The biodiversity of apples is being lost as our supermarkets stock only a few of the most popular varieties. The National Fruit Collection holds 2,200 varieties of apple but many of these are now represented by just one or two trees. In groups of four, ask pupils to think of as many benefits of planting an orchard as they can and write them on a large sheet of paper. Take feedback from each group and compare their ideas to those on the 'Trees for the Future with Smith' resource sheet.

You may wish to plant your own fruit tree in the school grounds. Apples are one of the easiest tree fruits to grow, are harvested during term time, and are a fantastic way for pupils to learn about ecosystems and the environment and will provide tasty snacks for decades.

WHAT YOU NEED

- A variety of apples, sliced in advance. Try to include some older varieties from trees in the local area or a farmers' market
- A pre-prepared graph on a large sheet of paper, with each column representing a different type of apple
- A copy of the 'Trees for the Future with Smith' resource sheet




Although apples have been cultivated in the UK since Roman times, only a third of apples we eat today are grown here.

An apple that travels from New Zealand has been on a journey of 11,690 miles before it reaches your lunchbox. Look at labels to find out where your apples have come from. What might be some of the disadvantages of this?



RESOURCE SHEET: TREES FOR THE FUTURE WITH SMITH



Growing a greater variety of fruit trees means that a pest or disease can't wipe out a whole crop at the same time. There's always a back-up when you opt for biodiversity.

Fruit from local orchards means that food does not travel such long distances before it reaches our plates. That's much better for the environment.

Orchards can provide a meeting place for the whole community, bringing everyone together to plant, look after and harvest crops.

Green Ambassador Smith loves eating and drinking and is a real guru on growing your own food. Here are some of Smith's thoughts on orchards.

Orchards provide a habitat for many types of plant and animal. Bees and wasps love the flowers on an orchard floor. Many species feed on the dead wood. In the autumn, mammals, bats and birds feast on fallen fruit, ahead of winter. And in winter, mistletoe is often found on apple trees, spread by birds that eat its berries.

You can't beat the taste of freshly grown fruit!

Fruit trees don't need a lot of looking after and give you fruit for many years to come.

Orchards allow nature to flourish and can provide a shady resting place even in a busy city.



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KNOW AND GROW POTATOES

OVERVIEW

Pupils put their skills of observation to the test through a fun starter. They then find out more potato facts with a quiz and go on to research ways to cook potatoes, and even grow their own.

OBJECTIVES

- Consider the biodiversity of food and why this is important
- Be inspired to grow their own food and encourage others to do the same

WHAT YOU NEED

- A bag of potatoes – one for each child. Having several varieties of potato will help to bring out the issue of biodiversity
- One copy of the 'Potato Quiz' sheet for each pair of pupils
- 'Grow your Own' poster template

GET GOING

Ask each pupil to pick a potato from the bag and, in silence, to look at it very carefully from all angles, noticing different spots of colour and blemishes. Pupils should also gently rub their potato, feeling its texture and observing its curves and bumps. After three minutes gather all the potatoes back in a pile and ask each pupil, in turn, to find their own potato.

Discuss how pupils identified their potato and draw attention to the variety. Get pupils to carry out the Potato Quiz in pairs and come back together to compare answers. Is there anything that pupils found surprising? Why does biodiversity matter?

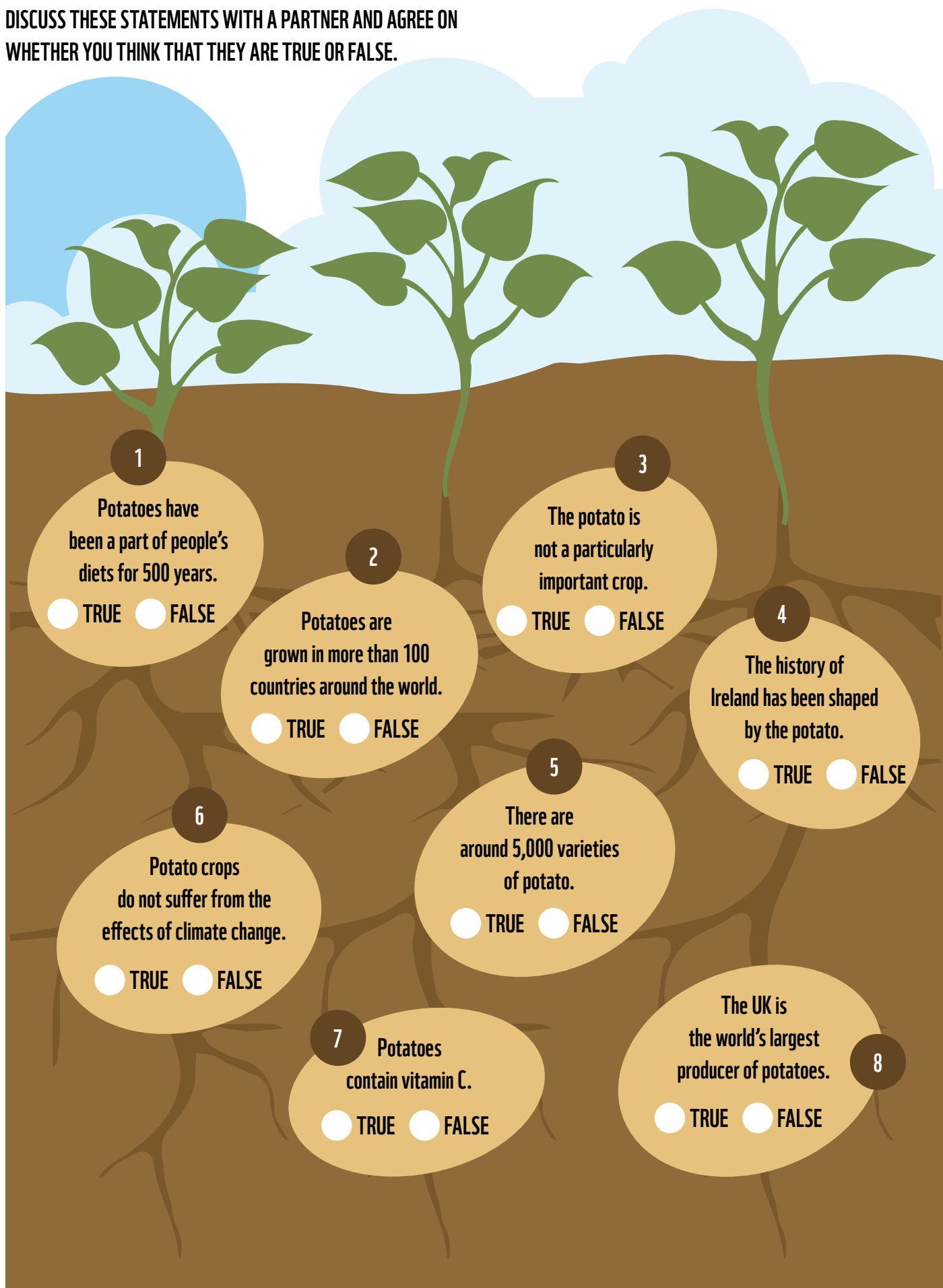
Why not grow your own potatoes or other foods in school? It's a great way to encourage children to eat a healthy diet and get active outdoors. Pupils will also love cooking what they have grown. Get pupils to search for healthy recipes online for anything from potato salad or leek and potato soup to Indian rosti.

For more information on growing, follow this link: wwf.org.uk/plant2plateresources

Pupils could also design a poster to encourage others in the school community to grow their own fruits and vegetables using the 'Grow Your Own' poster template.

RESOURCE SHEET: POTATO QUIZ: TRUE OR FALSE?

DISCUSS THESE STATEMENTS WITH A PARTNER AND AGREE ON WHETHER YOU THINK THAT THEY ARE TRUE OR FALSE.



RESOURCE SHEET: POTATO QUIZ – ANSWERS

Question 1

Potatoes have been a part of people's diets for 500 years.

FALSE

Potatoes have been around a lot longer! They began to be farmed about 8,000 years ago in the area around Lake Titicaca in the Andes on the border of modern day Bolivia and Peru.

Question 2

Potatoes are grown in more than 100 countries around the world ³.

TRUE

The potato is a very adaptable plant and can grow in a variety of climates and different types of soil conditions ⁴.

Question 3

The potato is not a particularly important crop.

FALSE

The potato is seen as the world's fourth most important food crop, after maize, wheat and rice ⁵.

Question 4

The history of Ireland has been shaped by the potato.

TRUE

In the 19th century, Ireland was heavily dependent on potatoes to feed a growing number of people. Very few varieties of potato were grown so, when a devastating new type of disease called potato blight took hold, most of the potato crop was destroyed. Harvests failed from 1845 to 1849. It's estimated that a million people died during the Great Famine and a million more emigrated to countries such as America, Australia, Canada and England ⁶. The history of the potato in Ireland shows us how important biodiversity is.

Question 5

There are around 5,000 varieties of potato.

TRUE

The International Potato Centre in Peru has preserved 5,000 varieties of potatoes. Some 200 varieties of wild potatoes are found in the Americas.

Question 6

Potato crops do not suffer from the effects of climate change.

FALSE

Climate change threatens the survival of wild potatoes and could mean that the area where wild potatoes grow naturally could be reduced by as much as 70 percent ⁷.

Question 7

Potatoes contain vitamin C.

TRUE

One medium-sized jacket potato with skin provides more vitamin C than two apples ⁸.

Question 8

The UK is the world's largest producer of potatoes.

FALSE

The world's largest producer of potatoes is China, which grows about a quarter of all potatoes.

3. <http://www.fao.org/potato-2008/en/potato/cultivation.html>

4. as above

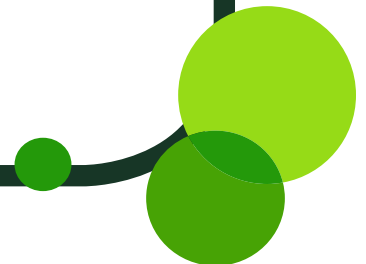
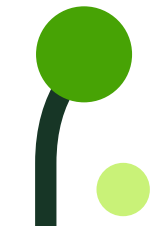
5. <http://www.fao.org/potato-2008/en/potato/index.html>

6. http://www.bbc.co.uk/history/british/victorians/famine_01.shtml#one

7. <http://www.fao.org/potato-2008/en/potato/biodiversity.html>

8. <http://www.fao.org/potato-2008/en/potato/cultivation.html>

GROW YOUR OWN





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PLAY FOR THE PLANET



OVERVIEW

This activity draws together what pupils have learnt in previous lessons. As they develop and play a board game they will consider the different choices we make and the impact that these have on our shared planet.

OBJECTIVES

- Consider a variety of threats to our environment and possible solutions
- Develop understanding of how the choices we make can make a difference

WHAT YOU NEED

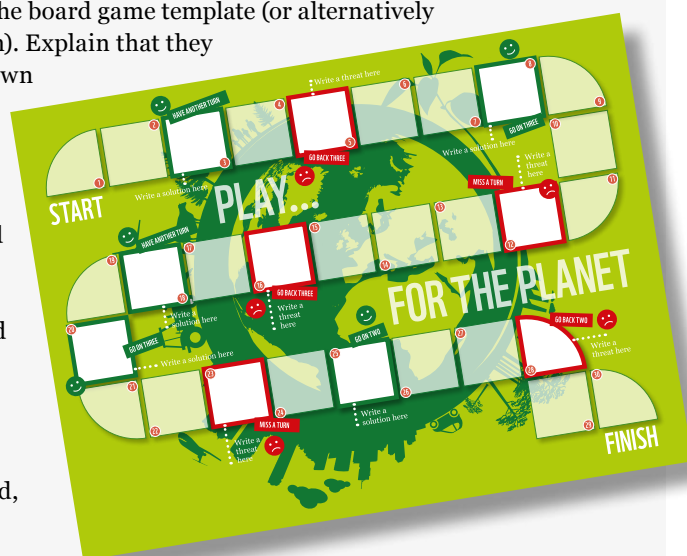
- An enlarged photocopy of the board game template for each group of four pupils
- One dice per board game
- Counters
- WWF 'LiveWell for Life' animation film <https://www.youtube.com/watch?v=R3hoyC4iEKA>
- Play for the Planet prompt sheet

GET GOING

Show pupils the animation film and discuss with the class how some of the ways that our food is produced, packaged and distributed can harm the planet. Together draw up a list of ways that that this happens, for example, by transporting food long distances or clearing areas of forest to grow food. Then draw up a second list of choices that we can make that are healthier for our planet.

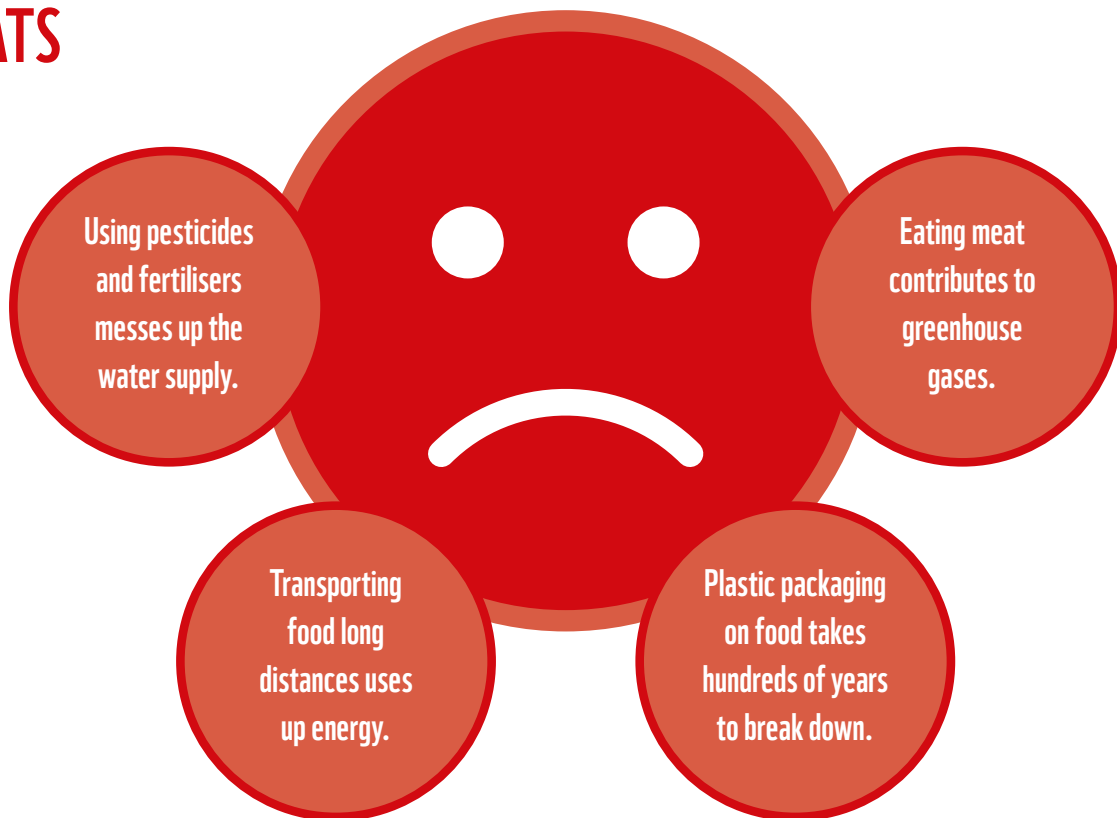
Give each group a copy of the board game template (or alternatively pupils can design their own). Explain that they are going to develop their own games which will remind them of things they can do to protect our planet. In the squares on their board games, pupils should write down some of the threats to the earth and solutions. Your pupils could use some of the examples on the Play for the Planet prompt sheet.

Once the games are finished, remember to allow time to play them!



RESOURCE SHEET: PLAY FOR THE PLANET PROMPT SHEET

THREATS



SOLUTIONS





WHAT DOES WWF DO?

Our planet is so special and diverse – but the shocking fact is that the world’s wildlife is being lost up to 10 times faster than the natural extinction rate. That’s why WWF is working hard not only to stop our damaging ways but to increase wildlife populations and strengthen the habitats they rely on.

Over the past five decades, we’ve helped bring several iconic animals back from the brink of extinction – including white and greater one-horned rhinos, mountain gorillas, giant pandas and tigers.

We’ve also achieved policy changes, for example helping bring about the global moratorium on commercial whaling, and improving controls on trade in threatened species.



For a future where people and nature thrive | wwf.org.uk

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