

# How do plants survive?

All plants have had to adapt to suit the environments in which they live. Different plant characteristics suit different environments.

- 1 You have to design a plant adapted to live in the \_\_\_\_\_.
- 2 You can choose up to 10 characteristics from those listed below in order to design a plant that will survive. You must think hard about what the environment is like.

|  |   |   |
|--|---|---|
| Leaves are large and shiny with 'gutters' and drip tips to shed heavy rainfall | Allows little undergrowth                           | Leathery leaves reduce moisture loss                  |
| Survives in drought conditions   | Sheds leaves at any time                            | Is fast growing                                       |
| Flowers  | Fights for sunlight                                 | Dark green leaves all year                            |
| Has quick life cycle   | Has waxy skin to reflect sunlight                   | No leaves   |
| Can withstand constant high temperatures                                       | Is evergreen  | Grow well spaced out                                  |
| Soaks up water   | Stores water in bulbs on roots                      | Has a long life                                       |
| Fleshy stem to store water   | Small, thin leaves                                  | Thick, fire resistant bark protects against heat      |
| Is sweet smelling  | Allows dense undergrowth                            | Spiky leaves  |
| Leaves have sharp edges to stop animals from eating them                       | Waxy, pointed leaves                                | Long roots reach underground water                    |
| Is tall and straight   | Has continuous growing season                       | Likes heavy rainfall                                  |
| Long, shallow roots soak up any rain   | Is a climber or vine-like                           | Fruit with thick skin                                 |
| Thick and tough skin   | Thick, waxy leaves protect against rain and insects | Is colourful  |
| Leaves roll up to reduce moisture loss   | Is slow growing                                     | Seeds protected in cones                              |
| Thick trunk  | Seeds can lie dormant for years                     | Conical tree shape                                    |
| Grows a long way from neighbouring plants                                      | Likes dark and damp                                 | Protective oils repel bugs                            |
| Likes strong sunlight  | Has wind-blown seeds                                | Small, grey, hairy leaves                             |
| Lies dormant for long periods  | Is a branchless tree                                | Is scented to attract pollinators and repel predators |
| Survives in nutrient-poor soil   | Shallow roots grow close to surface                 | Bulbs hide below the summer-scorched soil             |
|  | Large, buttress roots for support in the soil       |   |
|  | Has edible leaves or tubers                         | Has spines  |

- 3 Explain why you chose each characteristic.
- 4 Draw your imaginary plant and use your list of plant characteristics to label its features.

# How do animals survive?

All animals have had to adapt to suit the environments where they live. Different animal characteristics suit different environments.

- 1 You have to design an animal adapted to live in the \_\_\_\_\_.
- 2 You can choose up to 10 characteristics from those listed below in order to design an animal that will survive. You must think hard about what the environment is like.

|                                 |                                |                                     |
|---------------------------------|--------------------------------|-------------------------------------|
| Never drinks water              | Big ears                       | Sharp talons                        |
| Is a fast runner                | Stores fat                     | Can eat huge amounts at one time    |
| Pads on fingers and toes        | Big eyes                       | Looks beautiful                     |
| Can hibernate                   | Is colourful                   | Swims well                          |
| Is a fast mover                 | Is camouflaged                 | Eyes that look forward              |
| Large body                      | Can store water                | Lives in large groups               |
| Upper body covered in wool      | Can close eyes, nose and mouth | Can eat fruit and leaves            |
| Grinding teeth                  | Can swim                       | Climbs                              |
| Is nocturnal                    | Large padded feet              | Gills                               |
| Thick skin                      | Hides underground              | Prehensile tail                     |
| Is cold-blooded                 | Webbed feet                    | White fur                           |
| Very good eyesight              | Grasping hands and feet        | Digging claws                       |
| Strong, sharp claws             | Feathers                       | Stripes                             |
| Long, flexible limbs            | Has short hair                 | Is migratory                        |
| Little fat on lower body        | Uses smell to detect prey      | Is wary of humans                   |
| Thick fur                       | Strong teeth and powerful jaws | Can get fat                         |
| Long hair                       | Is agile                       | Can hold breath for 30 minutes      |
| Smooth skin                     | Whiskers                       | Can swerve on the run               |
| Sharp talons                    | Withstands low temperatures    | Is a solitary hunter                |
| Can withstand high temperatures | Is predatory                   | Can close nostrils                  |
| Is warm-blooded                 | Sharp teeth                    | Tough, leathery mouth to eat thorns |
| Is an amphibian                 | Avoids daytime heat            |                                     |
|                                 | Lives in trees                 |                                     |

- 3 Explain why you chose each characteristic.
- 4 Draw your imaginary animal and use your list of animal characteristics to label its features.

# Tropical rainforest, tropical desert and Mediterranean environments

Vegetation has had to adapt to the tropical rainforest, hot desert and Mediterranean climates.

1 Categorise the characteristics of vegetation below according to the environments in which they are most likely to be found, by highlighting them in different colours:

- tropical rainforest in green
- hot desert in red
- Mediterranean climate in yellow.

|   |  |
|---|--|
| Trees can grow to over 40 metres in an effort to get to sunlight                          | Quick life cycle to fit into the short growing season                |
| Spikes, instead of leaves, reduce loss of moisture and stop animals from eating the plant | Survives in a climate too hot and too dry for grasses                |
| Thick bark protects against the heat  | Survives on dark and damp forest floor                               |
| Leaves have drip tips to shed heavy rainfall  | Fleshy stems to store water  |
| Tree trunks grow straight and branchless at lower level in an effort to grow tall         | Long roots to reach down to underground water                        |
| Thick waxy skin reflects some of the sun's heat and reduces moisture loss                 | Trees can shed leaves at any time, but always look green and in leaf |
| Small, thin, waxy or leathery leaves to reduce moisture loss                              | Long shallow roots soak up as much water as possible after rain      |
| Little undergrowth because sunlight cannot reach ground level                             | Plants can store water in bulbs on their roots                       |
| Leaves can roll up tightly to reduce moisture loss  | Dense undergrowth where sunlight penetrates the trees                |
| Fallen leaves soon rot in the hot, wet climate  | Large buttress roots support the trees                               |
| Seeds can lie dormant for many years until it rains                                       | Thorn bushes with no leaves  |
|   | Bares fruit with thick skin  |
|   | Can live for 200 years   |

2 Complete a table like the one below.

| Characteristics of vegetation |            |                       |
|-------------------------------|------------|-----------------------|
| Tropical rainforest           | Hot desert | Mediterranean climate |
|                               |            |                       |
|                               |            |                       |

# How does global warming affect us?

In Britain alone, we are guilty of wasting around £4 billion a year through inefficient use of energy. It's never too early to start being energy efficient. There are many ways in which we can be more energy efficient in the home and help to limit the greenhouse effect.

- 1 Cut out the statements below, which are about the use of energy. Think about how to sort them into different categories and present your work as a spider diagram like this.



|  |   |  |
|--|---|--|
| My family and I don't buy products that can't be recycled.   | I encourage my family to share cars, and use public transport and bicycles as much as possible. | We use cold water rather than hot whenever possible.                     |
| I persuade family and friends to return junk mail in prepaid envelopes.  | We use energy-efficient lighting instead of traditional bulbs.                                  | We don't have a tumble dryer and only iron the essentials.               |
| I tell friends and family about the problems caused by using energy inefficiently.                               | I want to learn more about saving energy.   | Mum and dad only buy energy-efficient electrical appliances.             |
| My family uses less electricity by insulating the loft, windows, doors, water pipes, hot water tanks and floors. | I would always take a shower rather than a bath.  | I always turn off the light when I'm not in a room.                      |
| My parents get all leaks and drips repaired immediately.   | My family recycles waste paper, glass, aluminium and organic waste.                             | We have a compost heap in the garden.                                    |
| I encourage everyone to recycle and support local recycling initiatives.   | We re-use household water whenever we can.  | We collect rainwater and use it in the garden.                           |
| We don't buy products made of tropical hardwoods without the 'good wood seal'.                                   | My family keep the heating in our house to a minimum.   | We always read the labels to make sure the aerosols we buy are CFC-free. |
|  | My dad installed a time switch for the central heating.   |  |

- 2 Walk around your house and identify the ways in which you are contributing to global warming.
- 3 Write a list of the things that you could do to reduce global warming.
- 4 'Nobody made a greater mistake than he who did nothing because he could only do a little.' What do you understand by this statement in the context of global warming?