

2013 is the International Year of the Mathematics of Planet Earth.

Our planet is the setting for dynamic processes of all sorts, including the geophysical processes in the mantle, the continents and the oceans, the atmospheric processes that determine our weather and climates, the biological processes involving living species and their interactions, and the human processes of finance, agriculture, water, transportation and energy.

Whether findings are directly from the mathematical sciences or from branches of chemistry, physics or biology, the chances are that some form of mathematics is used.

There are four international themes for the year:

- A PLANET TO DISCOVER
- A PLANET SUPPORTING LIFE
- A PLANET AT RISK
- A PLANET ORGANISED BY HUMANS

Let's get everyone excited and proud of their mathematicians and scientists!

VISIT:
www.scholastic.co.nz/toolkit
to access supporting resources.

A Planet Supporting Life

Biodiversity

A simple definition of biodiversity is the amount of variety in the living organisms of a given environment. Generally speaking, the more living organisms there are and the greater the variety of those organisms, the healthier that environment is.

Living organisms are not spread evenly throughout the Earth. There are more living things in the rainforests near the equator, for example, than there are in the Polar regions. We don't know very much about marine ecosystems but it would be reasonable to suppose, given what we do know, that life forms (such as krill) may be more evenly spread across the Earth's oceans.

There are also variations in diversity inherent in different types of environments. For instance, the genetic diversity of species such as tortoises and finches is one of the most obvious things about the Galapagos Islands, and is what prompted Charles Darwin to investigate the idea of natural selection. Finding out more about the diversity of plants, animals, birds, insects and fungi in your local area can be a fascinating activity and one that most students seem to be very engaged in.

Environments

There are a few generic environments you may want to look at with your class, in addition to your local one. It should be fairly easy to find information and resources for any of these environments and the plants, animals and insects that inhabit them.

Forest

There are many different types of forests, from the pine forests of North America, through deciduous forests of Europe, the mixed forests of New Zealand, to the eucalypt forests of Australia. Climate and soil will influence the types of trees growing in a forest and the trees themselves will influence what will grow on the forest floor.

Rainforest

Rainforests are generally confined to the equatorial regions, with monsoon forests extending further north and south. The difference between these two forest types is that monsoon forests grow mostly during their wet season, while rainforests grow all year round. Rainforests contain the most abundant variety of living things of any land-based ecosystem.

Mountain

Mountain ecosystems can vary depending on how high up the mountain they are, with a single mountain containing several different environments. Animals and plants living in mountainous regions need adaptations that can allow them to cope with high altitudes, lower nutrient value in soil and leaves, as well as changes in temperature.

Plains and Pastures

Plains are areas that get more rainfall than deserts but generally less than forests. Pasture land can be natural plains or forest that has been cleared for farming. Natural plains have few if any trees, and grasses tend to be fairly hardy and adapted to retain water. These areas tend to be home to grazing animals, as well as predators feeding off them, and burrowers. Insects and birds are often plentiful.

Desert

Desert regions get very little rain, so everything, including plants, animals and insects, is adapted to preserve water at all costs. Desert plants often have deep roots which spread in all directions to search for water. They

have narrow leaves, and store water in thick, fleshy leaves or stems. Animals may be nocturnal or burrow underground to escape the heat.

Coastal

Coastal environments include beaches (whether shingle or sand), estuaries, mangrove swamps and tidal flats. Plants and animals in these areas have adopted very interesting ways to deal with salt and tides. Insects thrive in these environments, as anyone who has fished in an estuary will know. Birds are also plentiful around coastal areas, with many of them nesting in these areas to make use of plentiful food supplies.

Marine

Marine environments can vary from reefs close to shore, through seaweed beds (such as the kelp forests off Kangaroo Island that support the leafy sea dragon), Arctic and Antarctic, and into the deeper waters of the open ocean. The types of animals and plants living in an environment will depend on the temperature of the water, the amount of light and the water pressure. Marine environments also contain some of the smallest animals and plants on Earth.

Explore Your School Environment

After researching the different types of environments listed here, it is now time to go exploring in your school environment. Talk about the different organisms you have already witnessed living in your school grounds. Download the *Invertebrate Study* blackline master from the Teacher Toolkit. In pairs or small groups students can investigate what invertebrates they can find in a designated area. Fill in the results as you collate the results at the end.

Biodiversity Bingo

Brainstorm some new terminology that the students have become familiar with during the course of studying this unit. Try to come up with at least 25 to 30 words for a Bingo game. Give each child a piece of A4 paper containing a 3 x 4 blank grid. Allow students time to choose 12 words from your brainstorm list to put into their grid. Emphasise the need for grids to be different to others in order to have a better chance of claiming Bingo! To enable you to reuse the game, give children counters to cover words as they are called out. Students may even swap their grids with others for future games.

What Am I?

Extend students' knowledge of animal characteristics by playing a game of What Am I? Download the *What Am I?* blackline master from the Teacher Toolkit. Students can read the clues and guess what each animal is. After guessing they can draw a detailed diagram of the animal. Challenge students to create their own clues for a different animal to play a game of What Am I? with their classmates.

Design an Animal

How well did students understand the characteristics of a rainforest animal? What adaptations are necessary for these animals? This activity invites students to design their very own animal that could live in a rainforest. Download the *Design an Animal* blackline master from the Teacher Toolkit. Remind students to include as much detail as possible. What sort of food will it eat? Where will it live? How will it hide and protect itself from predators? What colour is it? Encourage students to make the animal as interesting as possible.

Resources available in the 2013 School Essentials catalogue

- *Let's Tackle Math Patterning and Sequencing*, page 155
- *Beginner's Balance*, page 160
- *Classroom Button Kit*, page 169
- *Mini-Beasts Close-Up*, page 193
- *Mini Beasts Life Cycles Specimens*, page 193
- *Giant Magnetic Life Cycles*, page 195
- *Ant Factory*, page 198
- *Worm Farm*, page 199
- *Green Thumb Classroom Greenhouse*, page 199
- *Bugnoculars*, page 215
- *Early Science Explorers Set*, page 216
- *Easi-Scope Digital Microscope*, page 218
- *Easi Viewer*, page 218
- *Mini Bulletin Board Sets: Amphibians, Insects and Reptiles*, page 224
- *Animal Classification Charts*, page 224
- *Life Cycle Photo Chart Set*, page 225

Free Teacher Toolkit Resources available at www.scholastic.co.nz/toolkit

- *Information Report* blackline master
- *Jungle Maze* blackline master
- *Reef Word Find* blackline master
- *Bindi Wildlife Adventures Teaching Support Kit*
- *Animal Report* blackline master
- *What Am I?* blackline master
- *Design an Animal* blackline master
- *Invertebrate Study* blackline master

