

# Astronomy & Ecology

## ASTRONOMY

### CURRENT SCIENTIFIC THEORY ABOUT THE CREATION OF THE UNIVERSE

Chart, Measures of balloon expansion .....	1
Blank chart, Measures of balloon expansion .....	2

### THE LIFE CYCLE OF STARS

Stellar nucleosynthesis .....	3
The sun, a typical star .....	4
Aldebaran, a red giant star next to the sun .....	5
Relative sizes of stars .....	6
Possible life cycles of a star .....	7

### THE VISIBILITY OF STARS AND THE CONSTELLATIONS

Chart, Top five brightest stars as seen from the earth .....	8
Distances (in light years) from earth to stars in the Big Dipper .....	9

### LIGHT-YEARS

The orbits of the planets .....	10
Chart, Distances in the solar system and beyond .....	11
How Olaus Roemer determined the speed of light .....	12

### ASTRONOMICAL TOOLS

A refracting telescope .....	13
A reflecting telescope .....	14
The solar spectrum .....	15

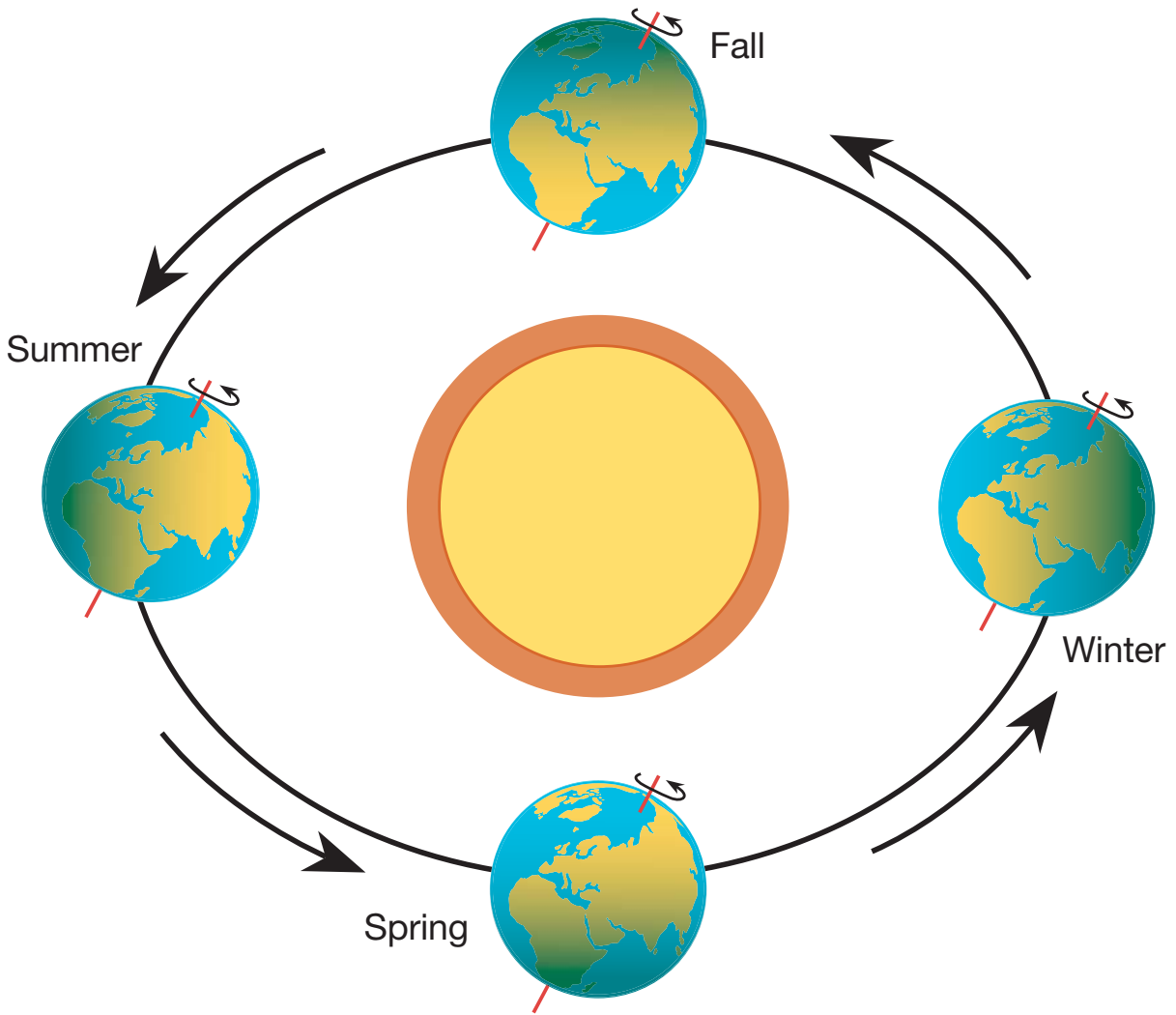
### THE SOLAR SYSTEM

The orientation of the sun and planets in the solar system .....	16
Chart, A few facts about the sun and planets .....	17
Uranus spins on its side .....	18

### EARTH AND SUN

The earth rotates on its polar axis .....	19
The earth orbits the sun .....	20
Sunlight passes through the atmosphere .....	21
Sunlight strikes the earth at different angles .....	22
The earth at the equinox .....	23

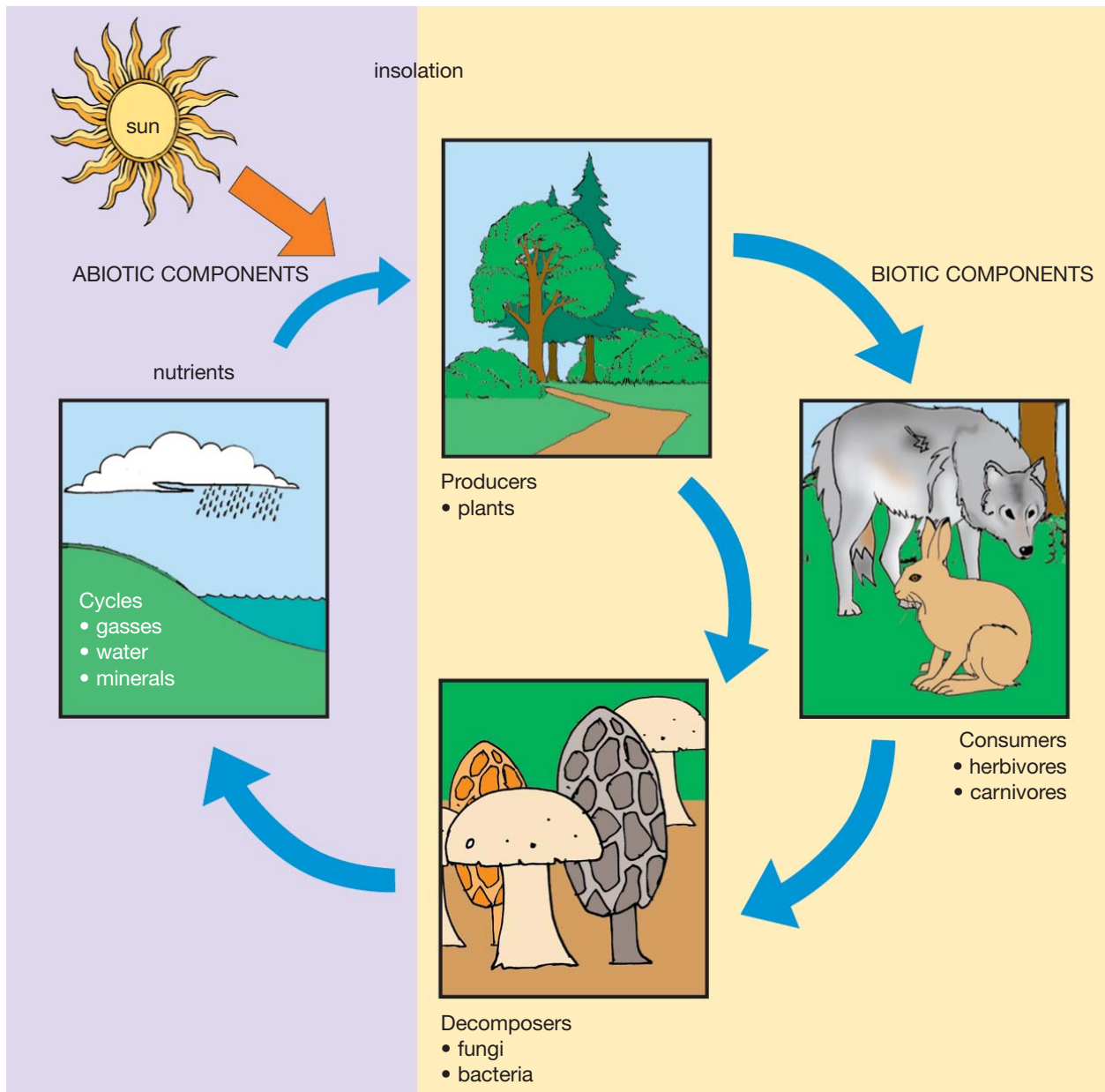
The earth at the northern winter solstice .....	24
The shape of the earth's orbit .....	25
THE MOON, TIDES AND ECLIPSES	
Phases of the moon .....	26
Direct and opposite high tides .....	27
A tidal graph .....	28
Spring and neap tides .....	29
A partial lunar eclipse .....	30
The sun, moon and earth during a solar eclipse .....	31
ASTEROIDS, COMETS AND METEORS	
The <i>Pioneer 10</i> plaque .....	32
Sample table for meteor experiment .....	33
ECOLOGY	
THE WEB OF LIFE	
Chart, Biome characteristics .....	34
Biomes created by latitude .....	35
Relationships between the biotic and abiotic parts of an ecosystem .....	36
A food web .....	37
FOOD CHAINS	
A food chain pyramid .....	38
A compost bin at work .....	39
DEPENDENCE AND INTERDEPENDENCE	
Chart, Moose and wolf populations .....	40
ADAPTATION AND EVOLUTION	
DNA .....	41
WATER POLLUTION	
Domestic wastewater treatment .....	42
AIR POLLUTION	
The greenhouse effect .....	43



*The earth orbits the sun*

## Biome characteristics

Biome	Characteristics
forest	<ul style="list-style-type: none"><li>• considerable rainfall</li><li>• hot or cold</li><li>• extensive land area dominated by trees</li><li>• includes the tropical rain forest and northern <b>coniferous</b>, or evergreen, forest</li></ul>
tundra	<ul style="list-style-type: none"><li>• moderate rainfall</li><li>• cold</li><li>• treeless, with small hardy plants growing close to the ground includes the Russian steppe and sub-arctic Canada</li></ul>
desert	<ul style="list-style-type: none"><li>• very dry</li><li>• hot or cold</li><li>• plants have water-conserving features</li><li>• includes the Sahara Desert and Antarctica</li></ul>
grassland	<ul style="list-style-type: none"><li>• low rainfall</li><li>• warm or cold</li><li>• mostly grass, with some hardy shrubs and a few trees</li><li>• includes the North American prairies</li></ul>
aquatic	<ul style="list-style-type: none"><li>• warm or cold</li><li>• has plants and animals able to live with low to high salt content</li><li>• includes all water-covered areas of the earth</li></ul>



*Relationships between the biotic and abiotic parts of an ecosystem*