They should be able to

1. Explain how the availability of resources influences species interactions.
2. Describe the global distribution and principal environmental aspects of terrestrial biomes.
3. Describe the global distribution and principal environmental aspects of aquatic biomes.
4. Explain the steps and reservoir interactions in the carbon cycle.
5. Explain the steps and reservoir interactions in the nitrogen cycle.
6. Explain the steps and reservoir interactions in the phosphorus cycle.
7. Explain the steps and reservoir interactions in the hydrologic cycle.
8. Explain how solar energy is acquired and transferred by living organisms.
9. Explain how energy flows and matter cycles through trophic levels.
10. Determine how the energy decreases as it flows through ecosystems.
11. Describe food chains and food webs, and their constituent members by trophic level.

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 01 (10 questions, answers on sheet 2)	
Teach the new content	Handout 01 Slide deck 01 Vocabulary list 01	
Practice guided then independent	Exercise sheets 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11 Past-paper sheets 1.2, 1.4, 1.5, 1.6, 1.9, 1.10, 1.11	
Check before they leave	Unit test 1 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

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They should be able to

1. Explain levels of biodiversity and their importance to ecosystems.
2. Describe ecosystem services.
3. Describe the results of human disruptions to ecosystem services.
4. Describe island biogeography.
5. Describe the role of island biogeography in evolution.
6. Describe ecological tolerance.
7. Explain how natural disruptions, both short- and long-term, impact an ecosystem.
8. Describe how organisms adapt to their environment.
9. Describe ecological succession.
10. Describe the effect of ecological succession on ecosystems.

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 02 (10 questions, answers on sheet 2)	
Teach the new content	Handout 02 Slide deck 02 Vocabulary list 02	
Practice guided then independent	Exercise sheets 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7 Past-paper sheets 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7	
Check before they leave	Unit test 2 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

They should be able to

1. Identify differences between generalist and specialist species.
2. Identify differences between K- and r-selected species.
3. Explain survivorship curves.
4. Describe carrying capacity.
5. Describe the impact of carrying capacity on ecosystems.
6. Explain how resource availability affects population growth.
7. Explain age structure diagrams.
8. Explain factors that affect total fertility rate in human populations.
9. Explain how human populations experience growth and decline.
10. Define the demographic transition.

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 03 (10 questions, answers on sheet 2)	
Teach the new content	Handout 03 Slide deck 03 Vocabulary list 03	
Practice guided then independent	Exercise sheets 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9 Past-paper sheets 3.1, 3.2, 3.3, 3.4, 3.5, 3.7, 3.8	
Check before they leave	Unit test 3 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

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They should be able to

1. Describe the geological changes and events that occur at convergent, divergent, and transform plate boundaries.
2. Describe the characteristics and formation of soil.
3. Describe similarities and differences between properties of different soil types.
4. Describe the structure and composition of the Earth's atmosphere.
5. Explain how environmental factors can result in atmospheric circulation.
6. Describe the characteristics of a watershed.
7. Explain how the sun's energy affects the Earth's surface.
8. Describe how the Earth's geography affects weather and climate.
9. Describe the environmental changes and effects that result from El Niño or La Niña events (El Niño–Southern Oscillation).

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 04 (10 questions, answers on sheet 2)	
Teach the new content	Handout 04 Slide deck 04 Vocabulary list 04	
Practice guided then independent	Exercise sheets 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9 Past-paper sheets 4.1, 4.2, 4.3, 4.6, 4.7, 4.8, 4.9	
Check before they leave	Unit test 4 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

They should be able to

1. Explain the concept of the tragedy of the commons.
2. Describe the effect of clearcutting on forests.
3. Describe changes in agricultural practices.
4. Describe agricultural practices that cause environmental damage.
5. Describe different methods of irrigation.
6. Describe the benefits and drawbacks of different methods of irrigation.
7. Describe the benefits and drawbacks of different methods of pest control.
8. Identify different methods of meat production.
9. Describe the benefits and drawbacks of different methods of meat production.
10. Describe causes of and problems related to overfishing.
11. Describe natural resource extraction through mining.
12. Describe ecological and economic impacts of natural resource extraction through mining.
13. Describe the effects of urbanization on the environment.
14. Explain the variables measured in an ecological footprint.
15. Explain the concept of sustainability.
16. Describe methods for mitigating problems related to urban runoff.
17. Describe integrated pest management.
18. Describe the benefits and drawbacks of integrated pest management (IPM).
19. Describe sustainable agricultural and food production practices.
20. Describe the benefits and drawbacks of aquaculture.
21. Describe methods for mitigating human impact on forests.

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 05 (10 questions, answers on sheet 2)	
Teach the new content	Handout 05 Slide deck 05 Vocabulary list 05	
Practice guided then independent	Exercise sheets 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17 Past-paper sheets 5.1, 5.2, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, 5.12, 5.13, 5.14, 5.15, 5.16, 5.17	
Check before they leave	Unit test 5 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

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They should be able to

1. Identify differences between nonrenewable and renewable energy sources.
2. Describe trends in energy consumption.
3. Identify types of fuels and their uses.
4. Identify where natural energy resources occur.
5. Describe the use and methods of fossil fuels in power generation.
6. Describe the effects of fossil fuels on the environment.
7. Describe the use of nuclear energy in power generation.
8. Describe the effects of the use of nuclear energy on the environment.
9. Describe the effects of the use of biomass in power generation on the environment.
10. Describe the use of solar energy in power generation.
11. Describe the effects of the use of solar energy in power generation on the environment.
12. Describe the use of hydroelectricity in power generation.
13. Describe the effects of the use of hydroelectricity in power generation on the environment.
14. Describe the use of geothermal energy in power generation.
15. Describe the effects of the use of geothermal energy in power generation on the environment.
16. Describe the use of hydrogen fuel cells in power generation.
17. Describe the effects of the use of hydrogen fuel cells in power generation on the environment.
18. Describe the use of wind energy in power generation.
19. Describe the effects of the use of wind energy in power generation on the environment.
20. Describe methods for conserving energy.

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 06 (10 questions, answers on sheet 2)	
Teach the new content	Handout 06 Slide deck 06 Vocabulary list 06	
Practice guided then independent	Exercise sheets 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13 Past-paper sheets 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.11, 6.12, 6.13	
Check before they leave	Unit test 6 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

They should be able to

1. Identify the sources and effects of air pollutants.
2. Explain the causes and effects of photochemical smog and methods to reduce it.
3. Describe thermal inversion and its relationship with pollution.
4. Describe natural sources of CO_2 and particulates.
5. Identify indoor air pollutants.
6. Describe the effects of indoor air pollutants.
7. Explain how air pollutants can be reduced at the source.
8. Describe acid deposition.
9. Describe the effects of acid deposition on the environment.
10. Describe human activities that result in noise pollution and its effects.

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 07 (10 questions, answers on sheet 2)	
Teach the new content	Handout 07 Slide deck 07 Vocabulary list 07	
Practice guided then independent	Exercise sheets 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8 Past-paper sheets 7.1, 7.2, 7.4, 7.5, 7.6, 7.7, 7.8	
Check before they leave	Unit test 7 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

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They should be able to

1. Identify differences between point and nonpoint sources of pollution.
2. Describe the impacts of human activities on aquatic ecosystems.
3. Describe endocrine disruptors.
4. Describe the effects of endocrine disruptors on ecosystems.
5. Describe the impacts of human activity on wetlands and mangroves.
6. Explain the environmental effects of excessive use of fertilizers and detergents on aquatic ecosystems.
7. Describe the effects of thermal pollution on aquatic ecosystems.
8. Describe the effect of persistent organic pollutants (POPs) on ecosystems.
9. Describe bioaccumulation and biomagnification.
10. Describe the effects of bioaccumulation and biomagnification.
11. Describe solid waste disposal methods.
12. Describe the effects of solid waste disposal methods.
13. Describe changes to current practices that could reduce the amount of generated waste and their associated benefits and drawbacks.
14. Describe best practices in sewage treatment.
15. Define lethal dose 50% (LD_{50}).
16. Evaluate dose response curves.
17. Identify sources of human health issues that are linked to pollution.
18. Explain human pathogens and their cycling through the environment.

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 08 (10 questions, answers on sheet 2)	
Teach the new content	Handout 08 Slide deck 08 Vocabulary list 08	
Practice guided then independent	Exercise sheets 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 8.10, 8.11, 8.12, 8.13, 8.14, 8.15 Past-paper sheets 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9, 8.10, 8.11, 8.14, 8.15	
Check before they leave	Unit test 8 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

They should be able to

1. Explain the importance of stratospheric ozone to life on Earth.
2. Describe chemicals used to substitute for chlorofluorocarbons (CFCs).
3. Identify the greenhouse gases.
4. Identify the sources and potency of the greenhouse gases.
5. Identify the threats to human health and the environment posed by an increase in greenhouse gases.
6. Explain how changes in climate, both short- and long-term, impact ecosystems.
7. Explain the causes and effects of ocean warming.
8. Explain the causes and effects of ocean acidification.
9. Explain the environmental problems associated with invasive species and strategies to control them.
10. Explain how species become endangered and strategies to combat the problem.
11. Explain how human activities affect biodiversity and strategies to combat the problem.

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 09 (10 questions, answers on sheet 2)	
Teach the new content	Handout 09 Slide deck 09 Vocabulary list 09	
Practice guided then independent	Exercise sheets 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10 Past-paper sheets 9.4, 9.5, 9.6, 9.7, 9.8, 9.9, 9.10	
Check before they leave	Unit test 9 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

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