

Key Stage 3&4 Tackling Climate Change Mapping

Readme

This document is a mapping of Tackling Climate Change issues against mainly Key Stage 3* curriculum for Biology, Chemistry, Geography and Physics.

It is arranged in eleven high level subjects (Header 1) which are then broken down into two further sublevels (Header 2 and 3). A good hierarchical view can be seen using the Navigation Pane or the Outline view.

The subjects represent a compilation of what we have seen broadly presented on the issue of tackling climate change by the reduction of carbon emissions. It is not focussed on mitigation measures of the effects of climate change, it is all about what subjects we consider needs to be taught to achieve Net Zero. The list is comprehensive.

Under each heading there are extracts from the curricula of KS3 Biology, Chemistry, Geography and Physics. You can trace their origin by the square bracket suffix relating to the relevant subject [B, C, G, P]. Maths is seen as a facilitating subject relevant to all subjects and so is not explicitly listed in this document.

We obviously do not expect Key Stage Three students be taught all these subjects. The document is simply a tool for teachers to understand the bigger picture and to use the curricula extracts to justify/segue teaching a particular subject they feel comfortable to do within the context of Tackling Climate Change.

The detail makes the document applicable at all educational levels where younger students might only be taught some of the Header 1 subjects at a high level and A Level and University students can study in detail at the Header 3 level.

There is a companion document to Tackling Climate Change called [KS3_Climate_Science_Mapping](#) which provides the same detail but relating to what we observe being broadly taught relating to understanding Global Warming and Climate Change.

Finally, anything in Green is good material to use to highlight green jobs.

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* There may be some content from KS4

Green means there is a career related to this topic.

1 Wedge Model

Note: Emissions reducing with time

2 Net Concept

Note: You can emit and sequester CO₂ so long as the net emission is zero.

3 Energy Types (or Stores)

3.1 What We have

3.1.1 Solar (Nuclear)

our sun as a star, other stars in our galaxy, other galaxies [P]

3.1.2 Gravitational

- Gravity is a force between all masses: keeps Earth in orbit around Sun, keeps Moon (& artificial satellites) in orbit around Earth; also gives rise to tides in the oceans. [P Space]

gravity force [P]

3.1.3 Chemical

internal energy stored in materials [P]

chemical reactions as the rearrangement of atoms[C]

representing chemical reactions using formulae and using equations [C]

exothermic and endothermic chemical reactions (qualitative) [C]

3.1.4 Electrical

potential difference [P]

3.1.5 Thermal

heating and thermal equilibrium [P]

3.1.6 Kinetic

forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) [P]

3.2 What we want

3.2.1 Electrical Working

potential difference [P]

3.2.2 Mechanical Working

forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) [P]

3.2.3 Heating

heating and thermal equilibrium [P]

Green means there is a career related to this topic.

chemical reactions as the rearrangement of atoms[C]

representing chemical reactions using formulae and using equations [C]

combustion, thermal decomposition, oxidation and displacement reactions [C]

exothermic and endothermic chemical reactions (qualitative) [C]

3.3 How we use

3.3.1 Solar Energy for Electrical Working- PV Cells

light transferring energy from source to absorber, leading to chemical and electrical effects; [P]

3.3.2 Solar Energy for Heating- Solar Thermal

the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface [P]

use of ray model to explain imaging in mirrors[P]

3.3.3 Gravitational Energy for Mechanical Working- Tidal, Hydro and Freefall

Note: Gravitational forces act between all masses: keeps Earth in orbit around Sun, keeps Moon (& artificial satellites) in orbit around Earth; also gives rise to tides in the oceans.

fuels and energy resources [P]

other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels [P]

pressure in liquids, [P]

gravity force [P]

3.3.4 Chemical Energy for Electrical Working- Fuel Cells and Battery Discharge

fuels and energy resources [P]

other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels [P]

3.3.5 Chemical Energy for Heating - Nuclear (Fission and Fusion), Ammonia, Hydrogen, Synfuels, Biomethane, Biofuels

fuels and energy resources [P]

other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels [P]

atoms and molecules as particles [P]

chemical reactions as the rearrangement of atoms[C]

representing chemical reactions using formulae and using equations [C]

combustion, thermal decomposition, oxidation and displacement reactions [C]

exothermic and endothermic chemical reactions (qualitative) [C]

human geography relating to the use of natural resources [G]

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3.3.6 Chemical Energy for Mechanical Working – Explosion from Nuclear (Fissions and Fusion), Ammonia, Hydrogen, Synfuels, Biomethane, Biofuels fuels and energy resources [P]

other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels [P]

atoms and molecules as particles [P]

the properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure [C]

changes of state in terms of the particle model [C]

chemical reactions as the rearrangement of atoms [C]

representing chemical reactions using formulae and using equations [C]

human geography relating to the use of natural resources [G]

3.3.7 Electrical Energy for Heating – Resistance heating, Heat pumps fuels and energy resources [P]

other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels [P]

differences in resistance [P]

conservation of material and of mass, and reversibility, in melting, freezing, evaporation, sublimation, condensation, dissolving [P]

explaining changes of state transition [P]

3.3.8 Electrical Energy for Mechanical Working – Electric motors fuels and energy resources [P]

other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels [P]

the magnetic effect of a current, electromagnets, DC motors (principles only) [P]

3.3.9 Thermal Energy for Mechanical Working – Steams engines and phase change engines, Geothermal

other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels [P]

the difference between chemical and physical changes [P]

explaining changes of state transition [P]

changes of state in terms of the particle model [C]

3.3.10 Kinetic Energy for Electrical Working – Dynamos and turbines fuels and energy resources [P]

other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels [P]

Green means there is a career related to this topic.

forces: resistance to motion of air and water [P]

pressure in liquids, [P]

the magnetic effect of a current, electromagnets, DC motors (principles only) [P]

3.3.11 Kinetic Energy for Mechanical Working- Wind Sails

fuels and energy resources [P]

other processes that involve energy transfer: changing motion, dropping an object, completing an electrical circuit, stretching a spring, metabolism of food, burning fuels [P]

forces: resistance to motion of air and water [P]

4 Energy Supply

fuels and energy resources [P]

4.1 National Electrical Grid

comparing amounts of energy transferred (J, kJ, kW hour) [P]

series and parallel circuits [P]

4.2 Methane Grid

comparing amounts of energy transferred (J, kJ, kW hour) [P]

human geography relating to the use of natural resources [G]

4.3 Hydrogen Grid

comparing amounts of energy transferred (J, kJ, kW hour) [P]

5 Energy Storage

Note: As opposed to energy “Stores” this is about Energy storage as batteries.

5.1 Energy density

density differences, between solids, liquids and gases [P]

5.2 Types

5.2.1 Chemical batteries – Li-ion etc.

internal energy stored in materials [P]

human geography relating to the use of natural resources [G]

5.2.2 Synfuels

internal energy stored in materials [P]

5.2.3 Hydrogen

internal energy stored in materials [P]

formulae for elements and compounds conservation of mass changes of state and chemical reactions [C]

chemical reactions as the rearrangement of atoms[C]

Green means there is a career related to this topic.

representing chemical reactions using formulae and using equations [C]

what catalysts do [C]

human geography relating to the use of natural resources [G]

5.2.4 Ammonia

internal energy stored in materials [P]

formulae for elements and compounds conservation of mass changes of state and chemical reactions [C]

chemical reactions as the rearrangement of atoms [C]

representing chemical reactions using formulae and using equations [C]

what catalysts do [C]

human geography relating to the use of natural resources [G]

5.2.5 Reverse Hydro

gravity force [P]

human geography relating to the use of natural resources [G]

5.2.6 Sand thermal

heating and thermal equilibrium [P]

5.2.7 Water Thermal

heating and thermal equilibrium [P]

internal energy stored in materials [P]

5.2.8 Coal shafts – Gravitricity

gravity force [P]

5.2.9 Compressed Air

atmospheric pressure, [P]

5.2.10 Flywheels

forces being needed to cause objects to stop or start moving, or to change their speed or direction of motion (qualitative only) [P]

6 Low Carbon Technologies

6.1 What has it to do with Net Zero?

6.2 Transport

6.2.1 Cycling

Green means there is a career related to this topic.

6.2.2 Electric Vehicles

series and parallel circuits [P]

the magnetic effect of a current, electromagnets, DC motors (principles only) [P]

6.2.3 Electric Trains

series and parallel circuits [P]

the magnetic effect of a current, electromagnets, DC motors (principles only) [P]

6.2.4 Heavy Goods

6.2.5 Electric Planes

series and parallel circuits [P]

the magnetic effect of a current, electromagnets, DC motors (principles only) [P]

6.2.6 Synfuel planes

what catalysts do [C]

6.2.7 Ammonia fuelled shipping

formulae for elements and compounds; conservation of mass changes of state and chemical reactions [C]

6.3 Buildings

6.3.1 Zero Emissions Buildings

6.3.2 Intelligent use of Timber

human geography relating to the use of natural resources [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

6.3.3 Heat Pumps

heating and thermal equilibrium [P]

6.3.4 Hydrogen boilers

heating and thermal equilibrium [P]

6.4 Agriculture

how organisms affect, and are affected by, their environment, including the accumulation of toxic materials [B]

the content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed [B]

Green means there is a career related to this topic.

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

6.4.1 Livestock Diet

the content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed [B]

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

how organisms affect, and are affected by, their environment, including the accumulation of toxic materials [B]

6.4.2 Vertical Farming and Hydroponics

6.4.3 Improved Nitrogen Fertilisers

representing chemical reactions using formulae and using equations [C]

what catalysts do [C]

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

human geography relating to the use of natural resources [G]

6.4.4 Agrovoltaics

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

6.5 Raw Materials Extraction

formulae for elements and compounds conservation of mass changes of state and chemical reactions [C]

what catalysts do [C]

exothermic and endothermic chemical reactions (qualitative) [C]

the order of metals and carbon in the reactivity series [C]

the use of carbon in obtaining metals from metal oxides [C]

human geography relating to the use of natural resources [G]

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interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

7 Efficiency

Note: Calculating fuel uses & costs: Comparing energy values (kJ), power ratings (kW), energy transferred (J, kWh) Fuels & energy resources [P - Energy] energy changes on changes of state (qualitative)[C]

7.1 What has it to do with Net Zero?

7.2 Buildings

domestic fuel bills, fuel use and costs [P]

7.2.1 Thermal

heating and thermal equilibrium [P]

7.2.2 Loft Insulation

heating and thermal equilibrium [P]

use of insulators [P]

7.2.3 Retrofitting

heating and thermal equilibrium [P]

use of insulators [P]

7.2.4 HVAC

heating and thermal equilibrium [P]

7.2.5 Smart

7.3 Appliances

7.3.1 Smart Efficient Appliances

comparing power ratings of appliances in watts (W, kW) [P]

7.3.2 Repairable Appliances

7.4 Energy Infrastructure

comparing amounts of energy transferred (J, kJ, kW hour) [P]

7.4.1 Gas pipe Replacement

Green means there is a career related to this topic.

7.4.2 Base Load. Intermediate Load Peak Load

7.5 Transport

7.5.1 Plane designs

7.5.2 EV

7.5.3 Train

7.5.4 Shipping

7.5.5 Sails

7.6 Manufacturing

7.6.1 Raw Materials Extraction

chemical reactions as the rearrangement of atoms [C]

representing chemical reactions using formulae and using equations [C]

what catalysts do [C]

exothermic and endothermic chemical reactions (qualitative) [C]

the order of metals and carbon in the reactivity series [C]

the use of carbon in obtaining metals from metal oxides [C]

human geography relating to the use of natural resources [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

7.6.2 Full cycle design

Earth as a source of limited resources and the efficacy of recycling, with reference to both materials and energy [C P]

7.6.3 Critical mineral use

Note: Nature of rocks (Ig/Sed/Met) & the rock cycle (brief!), measuring density of a rock (e.g. granite) by displacement. [C Earth & Atmosphere P Matter (particle model)]

what catalysts do [C]

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the rock cycle and the formation of igneous, sedimentary, metamorphic rocks [C]

human geography relating to the use of natural resources [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

7.7 Agriculture

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

how organisms affect, and are affected by, their environment, including the accumulation of toxic materials [B]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

7.7.1 Smart Agriculture

comparing energy values of different foods (from labels) (kJ) [P]

the content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed [B]

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

how organisms affect, and are affected by, their environment, including the accumulation of toxic materials [B]

8 Carbon Capture

8.1 Concept

8.2 What has it to do with Net Zero?

8.3 How

8.4 Nature Based

the reactants in, and products of, photosynthesis, and a word summary for photosynthesis [B]

Green means there is a career related to this topic.

how organisms affect, and are affected by, their environment, including the accumulation of toxic materials [B]

extend their locational knowledge and deepen their spatial awareness of the world's countries [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

8.4.1 New Woodland

the reactants in, and products of, photosynthesis, and a word summary for photosynthesis [B]

a word summary for aerobic respiration [B]

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

how organisms affect, and are affected by, their environment, including the accumulation of toxic materials [B]

extend their locational knowledge and deepen their spatial awareness of the world's countries [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

8.4.2 Peat Restoration

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

how organisms affect, and are affected by, their environment, including the accumulation of toxic materials [B]

extend their locational knowledge and deepen their spatial awareness of the world's countries [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

8.4.3 Biochar and weathering

formulae for elements and compounds conservation of mass changes of state and chemical reactions [C]

extend their locational knowledge and deepen their spatial awareness of the world's countries [G]

Green means there is a career related to this topic.

physical geography relating to: geological timescales and plate tectonics; rocks, weathering and soils; [G]

human geography relating to the use of natural resources [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

8.4.4 Oceanic Capture

formulae for elements and compounds conservation of mass changes of state and chemical reactions [C]

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

extend their locational knowledge and deepen their spatial awareness of the world's countries [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

8.5 Engineering Based

8.5.1 Landfill methane capture

8.5.2 Direct Air CO₂ Capture

formulae for elements and compounds conservation of mass changes of state and chemical reactions [C]

what catalysts do [C]

8.5.3 Exhaust flue capture

formulae for elements and compounds conservation of mass changes of state and chemical reactions [C]

simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography [C]

representing chemical reactions using formulae and using equations [C]

what catalysts do [C]

8.5.4 Bioenergy and CCS

simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography [C]

Green means there is a career related to this topic.

the reactants in, and products of, photosynthesis, and a word summary for photosynthesis [B]

the dependence of almost all life on Earth on the ability of photosynthetic organisms, such as plants and algae, to use sunlight in photosynthesis to build organic molecules that are an essential energy store and to maintain levels of oxygen and carbon dioxide in the atmosphere [B]

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

8.5.5 CO₂ Transport

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

8.5.6 CO₂ Underground Storage

the composition of the Earth [C]

the rock cycle and the formation of igneous, sedimentary, metamorphic rocks [C]

physical geography relating to: geological timescales and plate tectonics; rocks, weathering and soils; [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

9 Policy Global

9.1 Behaviour Change

human geography relating to: population and urbanisation; international development; economic activity in the primary, secondary, tertiary and quaternary sectors ;[G]

9.1.1 Meat and Dairy consumption

the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops [B]

Green means there is a career related to this topic.

human geography relating to: population and urbanisation; international development; economic activity in the primary, secondary, tertiary and quaternary sectors;[G]

9.1.2 Reduced Landfill

human geography relating to: population and urbanisation; international development; economic activity in the primary, secondary, tertiary and quaternary sectors;[G]

9.1.3 Slow transport

human geography relating to: population and urbanisation; international development; economic activity in the primary, secondary, tertiary and quaternary sectors;[G]

9.1.4 Pay for clean up

human geography relating to: population and urbanisation; international development; economic activity in the primary, secondary, tertiary and quaternary sectors;[G]

9.2 Developed versus Undeveloped Countries

human geography relating to: population and urbanisation; international development; economic activity in the primary, secondary, tertiary and quaternary sectors;[G]

9.3 Kyoto Protocol 1997

9.4 Paris Agreement 2015 NDC

10 Policy UK

10.1 Climate Change Act 2008

11 Monitoring

11.1 Scope 1,2,3 emissions

11.2 Emissions Calculations

11.2.1 Energy

comparing power ratings of appliances in watts (W, kW) [P]

energy changes on changes of state (qualitative)[C]

build on their knowledge of globes, maps and atlases and apply and develop this knowledge routinely in the classroom and in the field [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

Green means there is a career related to this topic.

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

11.2.2 Raw Materials Extraction

energy changes on changes of state (qualitative)[C]

build on their knowledge of globes, maps and atlases and apply and develop this knowledge routinely in the classroom and in the field [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

11.2.3 Manufacture goods

energy changes on changes of state (qualitative)[C]

build on their knowledge of globes, maps and atlases and apply and develop this knowledge routinely in the classroom and in the field [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

11.2.4 Transport

build on their knowledge of globes, maps and atlases and apply and develop this knowledge routinely in the classroom and in the field [G]

interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

11.2.5 Heating

comparing power ratings of appliances in watts (W, kW) [P]

11.2.6 Cooling

comparing power ratings of appliances in watts (W, kW) [P]

11.2.7 Food

calculations of energy requirements in a healthy daily diet [B]

build on their knowledge of globes, maps and atlases and apply and develop this knowledge routinely in the classroom and in the field [G]

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interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale, topographical and other thematic mapping, and aerial and satellite photographs [G]

use Geographical Information Systems (GIS) to view, analyse and interpret places and data [G]

use fieldwork in contrasting locations to collect, analyse and draw conclusions from geographical data, using multiple sources of increasingly complex information. [G]

11.2.8 Entertainment

11.2.9 Internet

comparing power ratings of appliances in watts (W, kW) [P]

11.3 Personal Footprint

11.4 Embedded Carbon

energy changes on changes of state (qualitative)[C]

11.4.1 Manufactured Products

energy changes on changes of state (qualitative)[C]

11.4.2 Manufacturing Equipment

energy changes on changes of state (qualitative)[C]

11.4.3 Buildings and Infrastructure

energy changes on changes of state (qualitative)[C]

11.5 Methane

11.5.1 Gas Leakage

11.6 Storage Calculations

11.6.1 Biomass

11.6.2 CCS

11.6.3 Manufacturing products

11.6.4 Building Materials

Green means there is a career related to this topic.