BBC Scotland Learning

Teacher's Notes BBC Two Spring 2009

Geography

Curriculum Match

Physical Environments — River Landscapes

Geography (Intermediate 1) course code C208 10

Geography (Intermediate 2) course code C208 11

Geography: Physical Environments (Higher) course code DF3C 12

Transmission time:
Programme 1 — Thursday 29 January 04.40–05.00
Programme 2 — Thursday 29 January 05.00–05.20

Physical Environments — River Landscapes

Programme One looks at how the river processes of erosion, transportation and deposition have shaped the river landscapes of the River Devon in Clackmannanshire and the River Cuckmere in East Sussex.

Programme Two focuses on the hydrological cycle within the river basins of the River Devon and the River Cuckmere.

Programme One: timed running order

Time	Content	Syllabus link Higher links are shown in Roman type *Intermediate links are shown in italic type*
00.00 – 00.25	Introductory graphics and music.	
00.25 – 01.10	Assorted views (some aerial) of features on Rivers Devon and Cuckmere.	Fluvial landforms and landscapes. The movement of water is a major agent in the formation of landforms and landscapes. *Rivers and their valleys — key landscape features.*
01.10 – 2.50	Start of commentary. Introduction of Rivers Devon and Cuckmere and their drainage basins. Discussion of processes of erosion, transportation and deposition which shape river landscapes.	Effects of flowing water in terms of erosion, transportation and deposition. *Rivers and their valleys — key landscape features.*
02.50 – 04.17	Features of the upper course of the Devon: source, underlying geology, valley shape, interlocking spurs, valley-side weathering and mass movement (animated graphic), bedload, explanation of corrasion (animated graphic).	Effects of flowing water in terms of erosion, transportation and deposition and the resultant landforms — upper section of river basin. Characteristic landscape features within a drainage basin; explanation of formation of such features. *Rivers and their valleys — key landscape features.* *River valleys — features at different stages* *a) upper stage — v-shaped valleys.*
04.17 – 06.30	Features of the upper course of the Cuckmere: source, valley profile, underlying geology, explanation of hydraulic action (animated graphic). Special features of the upper (glaciated valley) course of the Devon: river terraces (animated graphic) and meanders. Effect of adjoining tributaries on energy of rivers.	Effects of flowing water in terms of erosion, transportation and deposition and the resultant landforms — upper section of river basin. Characteristic landscape features within a drainage basin; explanation of formation of such features. *Rivers and their valleys — key landscape features.* *River valleys — features at different stages* *a) upper stage — v-shaped valleys.*
06.30 – 08.45	Features of the middle course of rivers (with reference to the Cuckmere). Meanders and associated processes of erosion and deposition (animated graphic). Formation of river cliffs and slip off slopes. Effect of helicoidal flow (animated graphic). Meander migration and riffles.	Effects of flowing water in terms of erosion, transportation and deposition and the resultant landforms — middle section of river basin. Characteristic landscape features within a drainage basin; explanation of formation of such features. *Rivers and their valleys — key landscape features.* *River valleys — features at different stages* *b) middle stage — meanders.*

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Programme One: timed running order (continued)

Time	Content	Syllabus link Higher links are shown in Roman type *Intermediate links are shown in italic type*
08.45 – 11.20	Waterfalls and their associated features (with reference to the middle course of the Devon at Rumblin' Brig): waterfall formation (animated graphic) and headward migration, gorges, plunge pools (animated graphic of processes of hydraulic action, attrition and corrasion), pot holes.	Effects of flowing water in terms of erosion, transportation and deposition. Characteristic landscape features within a drainage basin; explanation of formation of such features. *Rivers and their valleys — key landscape features.* *River valleys — features at different stages: waterfalls.*
11.20 – 12.00	Description and explanation of river capture on the Devon's middle course at Crook of Devon.	Characteristic landscape features within a drainage basin; explanation of formation of such features. *Rivers and their valleys — key landscape features.*
12.00 – 15.00	Features of the lower courses of the Cuckmere and the Devon: valley profile, flooding, alluvium, suspension, floodplain, levees, widening meanders and lateral erosion of floodplain. Human impact: strengthening of levees to reduce flood risk and straightening of course to speed flow.	Effects of flowing water in terms of erosion, transportation and deposition and the resultant landforms — lower section of river basin. Characteristic landscape features within a drainage basin; explanation of formation of such features. *Rivers and their valleys – key landscape features.* *River valleys – features at different stages* *b) lower stage — levee, floodplain.* *Opportunities and limitations of the physical environment for human activities.*
15.00 – 15.56	Formation of oxbow lakes (with reference to oxbow lake on floodplain of Devon): meander cut-off (animated graphic), deposition of alluvium, silting.	Effects of flowing water in terms of erosion, transportation and deposition and the resultant landforms — lower section of river basin. Characteristic landscape features within a drainage basin; explanation of formation of such features. *Rivers and their valleys – key landscape features.* *River valleys — features at different stages* *b) lower stage — oxbow lake.*
15.56 – 17.40	Lower course deposition: silting up of meanders on Cuckmere and formation of mudflats at mouth of Devon (alluvium combined with estuarine silt).	Effects of flowing water in terms of erosion, transportation and deposition and the resultant landforms — lower section of river basin. Characteristic landscape features within a drainage basin; explanation of formation of such features. *Rivers and their valleys – key landscape features.*

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Programme One: timed running order (continued)

Time	Content	Syllabus link Higher links are shown in Roman type *Intermediate links are shown in italic type*
17.40 – 18.32	Views of mouth of Cuckmere at Cuckmere Haven. Programme summary: the Devon and the Cuckmere react differently to the processes of erosion, transportation and deposition. Factors such as rock type, glaciation, frequency of flooding and man also influence river landscapes. Link to Programme Two: drainage basin processes on both rivers	Effects of flowing water in terms of erosion, transportation and deposition. *Rivers and their valleys — key landscape features.* *Movement of water within drainage basins.*
18.32 – end	Views of landscapes on Devon and Cuckmere. End credits.	Fluvial landforms and landscapes. *Rivers and their valleys — key landscape features.*

Programme Two: timed running order

Time	Content	Syllabus link Higher links are shown in Roman type *Intermediate links are shown in italic type*
00.00 – 00.15	Introductory graphics and music	
00.15 – 00.40	Assorted views (some aerial) of features on Rivers Devon and Cuckmere. Review of Programme One: physical features of the rivers are created largely by the power of moving water.	Fluvial landforms and landscapes. The movement of water is a major agent in the formation of landforms and landscapes. *Rivers and their valleys — key landscape features.*
00.40 – 01.15	The hydrological cycle operates on a global and local scale. Focus of this programme is the hydrological cycle within the drainage basins of the Devon (Clackmannanshire) and Cuckmere (East Sussex).	The water cycle, which constitutes a major physical system, operates on a variety of scales.
01.15 – 02.25	Explanation of the drainage basin hydrological cycle (animated graphic): inputs, throughputs and outputs including precipitation, interception, evaporation, overland flow, infiltration, through flow, percolation groundwater flow and storage.	Movement of water within drainage basins — inputs, storage, outputs.
02.25 – 05.00	Drainage basin controls on the River Devon: interview with Stephen Clark of Scottish Water who manage the reservoirs on the Devon. Identified controls in upper basin include climate, relief, geology and vegetation cover. Controls in lower basin of Devon are different e.g. underlying geology is permeable. Groundwater obtained from boreholes.	Knowledge and understanding of the opportunities and limitations of the physical environment in terms of human activities. The water cycle, which constitutes a major physical system, operates on a variety of scales. Movement of water within drainage basins — inputs, storage, outputs. *Understanding of the opportunities and limitations of the physical environment for human activities.*
05.00 – 08.26	Drainage basin controls on the River Cuckmere: land use at source, woodland (interception, evaporation, absorption by tree roots), permeable soil and underlying geology. Interview with Kevin Clark, Regional Production Manager for South East Water: groundwater reservoirs under South Downs contrast with surface reservoirs in the Ochils.	Knowledge and understanding of the opportunities and limitations of the physical environment in terms of human activities. Movement of water within drainage basins — inputs, storage, outputs. *Understanding of the opportunities and limitations of the physical environment for human activities.*

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Programme Two: timed running order (continued)

Time	Content	Syllabus link Higher links are shown in Roman type *Intermediate links are shown in italic type*
08.26 – 08.55	Comparison of the long profiles of Devon and Cuckmere (animated graphic): Devon profile reveals a river which has a higher source, is steeper and longer. Gradient has an influence on the speed and energy of the river.	Movement of water within drainage basins — inputs, storage, outputs. *Rivers and their valleys — key landscape features.*
08.55 – 12.15	Measuring the flow of rivers: gauging stations and methods of data collection. Interview with Richard Johnston of Mountain Environments (an environmental consultancy specialising in river gauging and flood management http://www.mountain-environments.co.uk). Demonstration of use of current meter and explanation of how river discharge on the Devon is calculated.	Movement of water within drainage basins — inputs, storage, outputs. Constructing and analysing hydrographs. Presenting and interpreting river flow data.
	Interview with Christopher Manning, Technical Officer with the Environment Agency http://www.environment-agency.gov.uk: demonstration of acoustic profiler used to measure discharge on Cuckmere, construction and interpretation of flood hydrographs including rising/falling limbs and peak discharge.	Constructing and analysing hydrographs. Presenting and interpreting river flow data.
12.15 – 15.00	Understanding flooding: recent flood events on the Devon and Cuckmere. August 2004 floods on the Devon caused by exceptionally heavy rain: interview with Kate Brander, resident in Menstrie. February 2001 floods on the Cuckmere caused by heavy rain and high tides: interview with local farmer Richard Mortimer-Lee.	Knowledge and understanding of the opportunities and limitations of the physical environment in terms of human activities.

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Programme Two: timed running order (continued)

Time	Content	Syllabus link Higher links are shown in Roman type *Intermediate links are shown in italic type*
15.00 – 18.20	River management and flood control: examples from Devon and Cuckmere. 'Slowing the Flow' WWF flood control project on the Devon www.wwf.org.uk/filelibrary/pdf/river_devon_leaflet_a.pdf Interview with Mike Donachy, Freshwater Policy Officer WWF Scotland: project aims to reduce run off by restoring wetlands and afforestation. Future management plans for Cuckmere: removal of flood defences and return of lower floodplain to an inter-tidal habitat with mudflats and saltmarsh. Interview with Kate Cole, Coastal Biodiversity Officer, East Sussex Project.	Knowledge and understanding of the opportunities and limitations of the physical environment in terms of human activities. Knowledge and understanding of how human activities can lead to various forms of environmental degradation and enhancement. *Understanding of the opportunities and limitations of the physical environment for human activities.*
18.20 – 18.44	Conclusion: river landscapes are dynamic and respond to processes and man's activities. Above all, they are determined by the physical characteristics of the drainage basin.	Fluvial landforms and landscapes. The movement of water is a major agent in the formation of landforms and landscapes. Effects of flowing water in terms of erosion, transportation and deposition. *Rivers and their valleys — key landscape features.*
18.44 – 19.00	End credits.	