**Glaciated Landscapes: Review & Checklist**

|  |  |  |  |
| --- | --- | --- | --- |
| **I can** | **☹** | **😐** | **☺** |
| Distinguish between different types of ice mass at a range of scales including:cirque glaciers, valley glaciers, highland ice field, piedmont glaciers, ice sheets and sea ice |  |  |  |
| Explain the glacial system concept with reference to inputs, outputs, stores and transfers of energy and materials |  |  |  |
| Describe and explain how inputs to and outputs from a glacier change over:* short time scales (i.e. seasonal)
* longer-time scales:
* historical time scales (i.e. the Little Ice Age)
* geological time scales (i.e. during the Quaternary Ice Age)
 |  |  |  |
| Explain what is meant by the glacial budget, including glacier mass balance and equilibrium |  |  |  |
| Explain how changes to the glacial system affect the glacial budget, mass balance & equilibrium |  |  |  |
| Give examples of positive and negative feedback in the glacier system |  |  |  |
| Define and distinguish between the terms: ice age, glacial, interglacial and stadial |  |  |  |
| Describe the likely causes of climate change through the Quaternary Ice Age |  |  |  |
| Describe:* past distribution of valley glaciers and ice sheets during the Quaternary Ice Age
* present day distribution of ice masses including valley glaciers and ice sheets
 |  |  |  |
| Distinguish between cold- and warm-based glaciers, their locations and rates of movement |  |  |  |
| Explain the differences between cold- and warm-based glaciers |  |  |  |
| Describe and explain the characteristics of glacier ice movement including:* internal deformation, basal sliding & compressional/extensional flow
* sub-glacial bed deformation
* surge conditions
 |  |  |  |
| Distinguish between weathering and erosion |  |  |  |
| Explain the processes of freeze-thaw weathering and nivation |  |  |  |
| Explain the processes of abrasion, plucking and sub-glacial fluvial erosion |  |  |  |
| Evaluate the importance of factors affecting glacial erosion including basal thermal regime, ice velocity, ice thickness, bedrock permeability and jointing |  |  |  |
| Identify & describe erosional landforms on maps and photos both for & beyond the UK:* **Macro-scale** including cirques, pyramidal peaks, arêtes, glacial troughs, ribbon lakes, hanging valleys and truncated spurs;
* **Meso-scale** including roches moutonnées, crag and tail
* **Micro-scale** including striations
 |  |  |  |
| Explain the processes of glacial and fluvioglacial transport including supraglacial, englacial and sub glacial transfers. |  |  |  |
| Explain how these processes produce distinct sediment characteristics (size, shape and sorting). |  |  |  |
| Identify & describe depositional landforms on (maps and) photos both for & beyond the UK:* **Glacial:** including types of till (ablation, lodgement and deformation) and types of moraine (terminal, recessional, lateral, medial and push) and drumlins
* **Fluvioglacial:** ice-contact features including eskers, kames, kame terraces
* **Proglacial:** including sandurs, varves, kettle holes and kettle lakes
 |  |  |  |
| Explain the formation of these erosion and deposition landforms. |  |  |  |
| **I can** | **☹** | **😐** | **☺** |
| Evaluate the role played by different glacial and post-glacial processes in creating different glacial landforms and landscapes |  |  |  |
| Describe and explain variations in landforms between:* highland and lowland glaciated landscapes
* landscapes produced by ice sheets and valley
 |  |  |  |
| Describe and explain how processes and landforms change over different time-scales:* In seconds: rapid mass movement processes causing changes in glacial valley profiles
* Seasonal variations in fluvioglacial transport and deposition
* Changes over millennia: post glacial reworking of glacial deposits, infilling of glacial lakes and creation of misfit streams by fluvial processes
 |  |  |  |
| Select and use appropriate graphical techniques to present data effectively, including:* scattergraphs and radial graphs
 |  |  |  |
| Select and use appropriate statistical techniques to analyse data effectively, including:* Measures of central tendency (mean, mode, median)
* Range/variation (range, interquartile range and standard deviation)
* Correlation (Spearman’s Rank)
 |  |  |  |
| Describe global patterns of periglacial landscapes both now and in the past. |  |  |  |
| Describe and contrast different aspects of permafrost:* Continuous, discontinuous and sporadic permafrost
* The active layer
* Talik (open, closed and through).
 |  |  |  |
| Describe and explain the seasonal cycles in the active layer in relation to frost action, water and wind. |  |  |  |
| Describe and explain these periglacial processes:* Frost weathering (freeze-thaw), mass movement, nivation, solifluction and frost heave.
 |  |  |  |
| Describe and explain the development of characteristic periglacial features and landscapes with reference to the above processes and cycles:* ground ice formations: Ice lenses, ice wedge polygons, patterned ground, pingos and thermokarst landscapes
* nivation hollows
* blockfields, scree slopes and protalus ramparts
* solifluction terraces and head deposits
 |  |  |  |
| Describe and explain how the action of water and wind can affect periglacial landscape development to produce dry valleys and loess plateaux. |  |  |  |
| Describe and explain the impacts of glacial processes and landforms and landscapes on human activity, including glacial lake outburst floods (GLOFs) |  |  |  |
| Describe and explain the impacts of human activity on glacial processes and landforms and landscapes, including extraction of sands and gravels, and the creation of reservoirs. |  |  |  |
| Describe one strategy to manage either the impacts of glacial processes/landforms/landscapes on human activity or human activity impacts on glacial processes/landforms/landscapes |  |  |  |
| Describe and explain how human activity can degrade permafrost. |  |  |  |