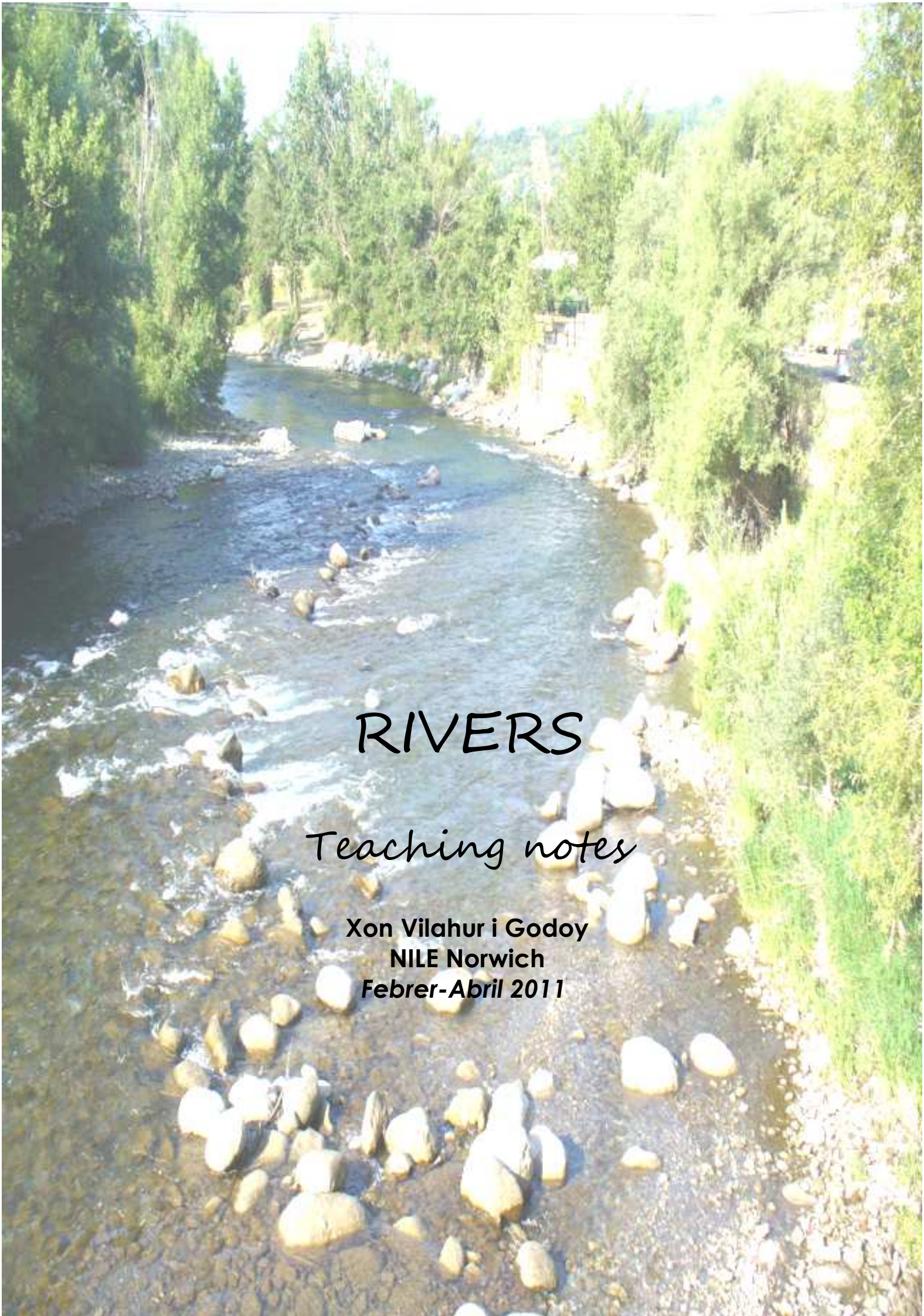

RIVERS

Teaching notes

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INDEX

INTRODUCTION

CLIL activities are not easy for students, but they can be more encouraging than activities done in the first language Why? Because, as a result of the additional effort that studying a curricular subject in English requires for most students, lessons have to be planned in a way that allows all students to participate and to be more autonomous, and communicative activities are therefore very useful. There are several considerations which are necessary for all the CLIL activities, and as teachers we should have these always in mind.

Make sure that all the students understand the meaning of new words; give students time to think and to ask questions if necessary, always have dictionaries in the classroom (they are always very useful and internet sometimes is not available). This support is even more necessary at the beginning of the project. It makes the lessons longer, but later students are able to understand the majority of the vocabulary.

Encourage work in collaborative groups, and ensure that all the students in the group can contribute something valuable to it. Don't allow them to make the groups. It is better if you group them and don't allow changes for friendship reasons. They have to build their knowledge through interaction, but remember that you are there to help them.

Don't forget to write on the board using big letters and many visuals. At the end of the lesson the board should show a summing up of the lesson.

Most activities can be done in a different order and the timing is just approximate because it can vary dramatically depending on the number and the type of students.

As I work on rivers, I've used examples from my region, but you can change them using a river that is more familiar to your students.

Finally, I've used different symbols:

 Timing

 Working in plenary

 Working in groups

 Working in pairs

 Individually

And remember, life is like a journey along a river; we start running fast but we can be lost in different creeks, looking for our main stream, then we carry more load and we run slower, taking time meandering on the flood plain. At the end we reach the beach and we can rest looking behind and smiling.

So was my life through this 10-week experience!

Start your journey along the river and have fun!

CONTENT

UNIT 1. WEATHER AND LANDSCAPES

1.1. ROCK LANDSCAPES

Different rocks are weathered in different ways, so each rock produces its own landscape:

- ⇨ Granite landscape: tors, spheroid granite boulders, onion-skin weathering.
- ⇨ Sandstone landscape: angular forms, cliffs, dunes.
- ⇨ Basalt landscape: flows of lava, hexagonal pillars.
- ⇨ Chalk and limestone landscapes (karst): dolines, caves, caverns, holes, stalactites, swallow-hole

1.2. WHAT IS WEATHERING?

Rocks are solid, however wind, gases from the atmosphere, water, ice or living beings can break them down. **Weathering** is the breaking down of rocks into small particles such as sand and pebbles. It may be:

Mechanical weathering is the breaking down of rocks in smaller pieces by physical processes. **Freeze-thaw** is the fracture of rock by repeated frosts: water during the day and ice during the night, so the crack is enlarged. **Exfoliation** is due the expansion in hot temperatures during the day, and contraction in cold nights. **Abrasion** rocks are broken down by particles such as sand carried by wind or water.

Chemical weathering is the breaking down of rocks by chemical reactions. Some rocks can react with water (hydrolysis), oxygen (oxidation) and with carbonic acid from the acidic rain (carbonation).

Biological weathering is the breaking down of rocks by living organisms, for example damage from tree roots, from animals walking or from machineries.

1.3. WHAT IS EROSION?

Erosion is the process of carrying away the small rock particles such as sand and pebbles. The main agents of erosion are: Water (in rivers, ocean waves and glaciers), wind , gravity and animals and machinery.

Rivers erode in four ways: **Hydraulic action**, the force of the flowing water on the bed and banks. **Abrasion**, stones carries by the river wear away the channel (sandpaper effect). **Attrition**, stones collide becoming smaller and rounder. **Corrosion**, acidic waters dissolves rocks made of calcium carbonate.

http://www.juicygeography.co.uk/downloads/flash/erosion.swf

1.4. WHAT IS TRANSPORTATION?

The material carried by a river is called its **load,** depending on the size of the flood, the river can carry more or fewer materials, the maximum weight of load a river can carry is the **Capacity.**

The load is transported in four ways: **Traction,** stones are rolled along the river bed**, saltation,** stones bounce along the river bed, **suspension,** particles of silt and clay float in the water**, solution,** minerals dissolve in the river water.

http://www.juicygeography.co.uk/downloads/flash/transport.swf

1.5. WHAT IS DEPOSITION?

In places where the river slows down, it loses energy and deposits some of the material it is transporting: inside bends of meanders, and middle and lower course or the river. Heaviest materials are deposited first and sand and clay are deposited last. Minerals in solution become salt in the sea.

Depending on their size, the particles can be classified as: Boulders, Cobbles, pebbles, sand, silt and clay.

UNIT 2. RIVER PROCESSES

2.1. WHAT HAPPENS TO RAIN WATER?

When rainwater hits the surface of the ground, some sinks into it, some flows over the surface, and some is taken up by plants, later returning to the atmosphere.

The water below ground can fill in spaces and pores in rock and rarely moves, it's called **groundwater.** Sometimes this water flows along following small tunnels in the ground; this is called **throughflow** and can be a source of water for rivers.

Rainwater runs off over the land when the ground becomes saturated, or when the rain falls too fast to infiltrate; this is called **overland flow.**

http://civil.sharif.edu/~ataie/gwsite/index.htm

REVISION:

http://www.epa.gov/safewater/kids/flash/flash_watercycle.html

http://www.bbc.co.uk/schools/riversandcoasts/rivers/whatis_river/index.shtml

http://www.youtube.com/watch?v=TKTpEMXLO8w&playnext=1&list=PL35DF9BDAF1D7D55C

2.2. DISCHARGE AND VELOCITY

Discharge is the amount of water in a river. It's measured in cubic meters per second (m^3/s). Discharge usually increases from source to mouth because tributaries add water to the main channel. As discharge increases, the width and depth also increase.

The following factors affect the amount of discharge:

Rainfall (type and amount), temperature (hot or cold), previous weather (wet or dry), relief (steep or gentle) rock type (permeable or impermeable) land use (urban or rural).

After a rainstorm, the water level in a river rises, dropping back to normal once the storm is over. A **Hydrograph** is a graph showing the flow in a river after a storm, it shows two variables: rainfall and river discharge.

Because rainwater takes time to flow overland and through the ground to the river, there is a delay or **lag time** for the flow to rise to its peak.

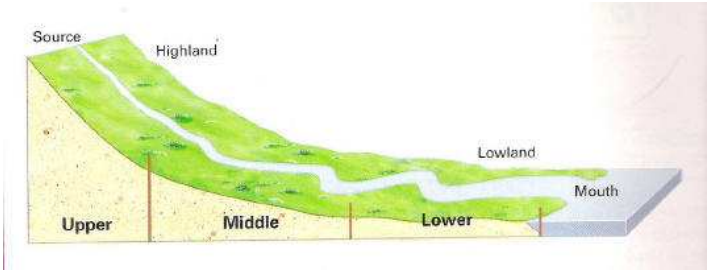
Velocity is the speed of the river. It´s measured in m/s; it usually increases from source to mouth.

2.3. LONG PROFILE OF A RIVER

The long profile of a river is a cross-section from its source to its mouth.

The course of a river can be divided into 3 main sections: upper course, middle course and lower course.

Rivers begin flowing in highland areas and flow downwards to lowland areas.



2.4. RIVER VALLEY CROSS-SECTION

The shape of a river changes between the source and the mouth:

	A. UPPER VALLEY	B. MIDDLE VALLEY	C. LOWER VALLEY
SHAPE	Narrow V-shaped	Wider V-shaped	Wide flat
SIDES	Steep	Gentle	Very gentle
EROSION	Downwards (vertically)	Downwards and sideway (vertically and laterally)	Sideways (laterally) and deposition
BEDLOAD	Angular boulders and cobbles	Smooth and round pebbles	Sand, silt and clay

UNIT 3. RIVER LANDFORMS

3.1. RIVER-BASIN

A **river basin** is an area drained by a river and its tributaries. Other river features include:

Watershed, an area of higher land separating two drainage basins.

Source, the place where a river begin

Tributary, a smaller river joining a large river

Confluence, the place where two rivers join.

Mouth, the place where a river enters in a lake or the sea

Streams or brooks are the names given to small rivers

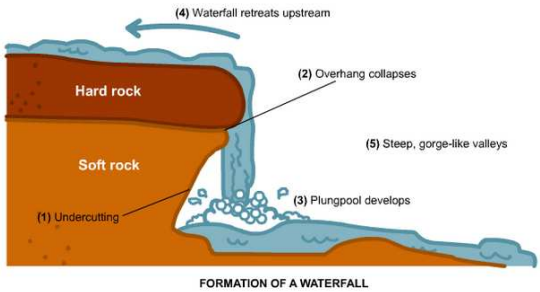
Drainage pattern is the way rivers are arranged on the landscape, the most commons ar, dendritic, parallel or radial.

http://techalive.mtu.edu/meec/module01/whatiswatershed.htm

3.2. WATERFALLS AND RAPIDS

A **waterfall** is a place on a river where water flows vertically. Waterfalls are a common feature in the upper course of many large rivers. A waterfall occurs when a layer of hard resistant rock lies over a layer of softer rock, which will erode more easily.

1. As water fall, the softer rock is eroded much quicker therefore undercutting the harder rock.
2. The hard, overhanging rock eventually collapses.
3. The rocks collapsed fall into the plunge pool causing more erosion of the soft rocks and a deeper plunge pool.
4. This goes on continuously causing the waterfall to move upstream.
5. It leaves a steep sided gorge as it retreats.



FORMATION OF A WATERFALL

Rapids are a series of little waterfalls; these can be found where a waterfall has retreated, the hard rock layer is undercut causing the waterfall to move upstream. They are found where there are alternative bands of hard and soft rocks.

3.3. FLOODPLAIN,

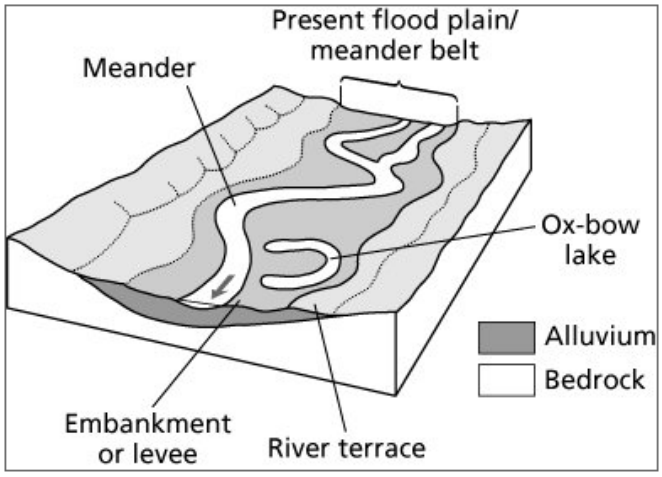
3.3.1. MEANDERS AND OX-BOW LAKES

As the river enters the middle course the gradient of the river becomes less steep. Lateral erosion becomes more important and the river starts to meander, it swings from side to side, forming large bends called **meanders.**

Over time, the loop of a meander becomes tighter. If it becomes too tight the river may simply cut across the neck of the meander to form a straight river channel. The loop is cut-off from the main channel and forms an **ox-bow** lake.

http://www.youtube.com/watch?v=8uV-BuBpIFw&feature=related

In the lower course of a river, due a combination of erosion and deposition **food plains** are formed: an area of flat land formed on either side of a river. Here there is more lateral (sideways) erosion. The channel is wide and deep. The river has less friction to overcome, which means that the river can flow faster.



meander

3.3.2. FLUVIAL TERRACES

Fluvial terraces are elongate deposits of fluvial sediments that flank the sides of floodplains and fluvial valleys all over the world. They lie parallel to and above the river channel and its floodplain.
Fluvial terraces (also called stream terraces) are the remnants of earlier floodplains that existed at a time when a river was flowing at a higher elevation; then the stream has changed its elevation and has created a new floodplain.

Changes in elevation can be due to changes in the base level or in the volume of the fluvial flow due to changes in climate, typical of areas which were covered by ice during periods of glaciations, and their adjacent drainage basins.

http://www.ingeba.org/lurralde/lurranet/lur30/30soria/30soria.htm

http://www.uwsp.edu/geo/faculty/lemke/geomorphology/lectures/05_floodplains.html

http://www.earthscienceworld.org/images, photo ivq0ux

3.4. MOUTHS: DELTAS AND ESTUARIES

As a river reaches the mouth, it has a large discharge and the river channel is deep and wide.
The valley is now wide and flat. This creates a wide flood plain around the river.
A **flood plain** is a flat area around a river that regularly floods. Each time a river floods, silt (alluvium) is deposited on the flood plain. This makes it very fertile and good for farming and agriculture. Flood plains are often highly populated, and farming employs many people.
Rivers may sometimes flow across the food-plain between raised banks; these banks, called **levees**, are formed in times of flood when the river drops much of its load.
Deltas are a feature found at the mouth of large rivers (Ganges, Nile, Ebre,…). When a river enters the sea, it deposits its load; if this occurs faster than the sea can remove the material, because the sea is tideless, a delta may form. Over time, it becomes a permanent land feature, rich in alluvium and providing fertile farmland.
Estuaries are funnel-shaped river mouths. Most are found where an existing river has had its lower reaches flooded after changes in sea level.

3.5. FLOODINGS

A **flood** occurs when a river overflows its banks. This is because there is a rapid increase in discharge over a short period of time and the river system is unable to transport it away.

Factors: Both human and physical factors influence the amount of water passing through a river:

Physical factors: prolonged rain or a short heavy rain storm, snow melt which releases stored water; steep slopes, narrow valleys or impermeable rocks.

Human factors: Deforestation, construction of urban areas, changes of the natural course of the river.

Impacts: Floods can be devastating and cause extensive damage, destroying food supplies, buildings, farmlands, vehicles, transports, power and people. Floods tend to have a worse impact on LEDCs than they do on MEDCs. Emergency services, money, equipments, and poor communications in LEDCs make recovery more difficult.

Floods can benefit people and the environment; when a river floods, it deposits fine silt and sediment, which helps to fertilise the soil and generates excellent conditions for farming. Some LEDCs use river flooding to cover farmland with fertile alluvium and also to provide water for irrigation channels (e.g. Ganges in Bangladesh)

Prevention: Floods can be predicted, prevented and controlled. Flood management to reduce the impact of flooding includes different measures: river management, changing land use, dams and reservoirs...

http://www.sln.org.uk/geography/schools/blythebridge/GCSERiversRevisionFloods.htm

UNIT 1	WEATHER AND LANDSCAPES
LESSON 1.1.	ROCK LANDSCAPES

ACTIVITY 1.0. ***Why rocks, landscapes and rivers?***

Aim: to motivate the students, to introduce students to the topic and to encourage them to produce simple sentences orally

25 ‘

Development:

1. Start this unit with the comic.
2. Students read the text in the bubbles.
3. They talk with a partner and find out one word in each bubble related with the subject.
4. They write the 5 words .
5. Check their understanding of vocabulary orally.
6. They answer the following question, using the substitution table:
7. Explain the content and the objectives of the lesson.
   Are you interested in rocks and rivers? Why or why not?

If you want to spend more time then the comic could be used in different ways:

- Students read it and add a sentence
- Cut out the speech bubbles so students can match them with the images
- Present it with some gaps to fill in
- etc.

RESOURCES

Material required

Comic

Scaffolding

Substitution table

I’m interested in I’m not interested in	Rocks Landscapes Rivers ……	because	I want I don’t want	to be to study	Geology Geography Mineralogy Hydrology ….
I like I don’t like					A fisherman, A sailor, a geologist …..

Supplementary materials

Comic 1.0.

ASSESSMENT	DIFFERENTIATION
None	None

UNIT 1	WEATHER AND LANDSCAPES
LESSON 1.1.	ROCK LANDSCAPES

ACTIVITY 1.1. BETTING GAME: WATER AND LANDSCAPES

Aim: Presentation, To find out students' previous knowledge of rock, landscapes and external geological processes.

30 '

Considerations: This might be the first lesson in CLIL, that means the first science lesson in English, so it's a good idea to start with word and sentence level, slowly increasing the difficulty of the content and the language as well. Therefore there are simple sentences with very common words (river, weather, rainfall, meander, delta, mouth, pebbles...) and there is scaffolding. Some students may know the content in Catalan.

Development:

1) Hand out worksheet 1.1. A.
2) Play the game

Step 1 individually, step 2 in pairs, from step 3 to the end in plenary.

1. Explain that some of the statements are right and some of them are wrong. If they think the statement is right, they put a tick in the right column, if they think it is wrong, they put a tick the wrong column.
2. Students compare their answers then agree on the answer and on a bet (10 / 20 / 30 ....100) and write the number in the bet column.
3. Set a time limit then check orally.
4. If they are right, they get the number of points they have bet. If they are wrong, they lose the number of points they have bet.
5. They add the total losses and gains to reach a total. (gains minus losses) . Who has the most points?
6. They can score a maximum of 100 points for each correct answer up to 1.000 points. Compare results and discuss why some results are wrong. Let students participate.

3) Hand out the Homework 1.1. B.

The words and the meaning of the whole sentences have been explained during the plenary discussion. So, students should be successful in this exercise. This exercise can be done as homework or at the end of the lesson.

RESOURCES

Required material

Scaffolding.

Laminated cards with the main words with pictures on the walls.

Useful expressions written on the whiteboard

to check		
To bet	orally	I think that....
To agree	carefully	I agree with....
To reach		In my opinion...
To add	Upper	That is important because ....
to get		This is wrong because.....
to break		
down		

Supplementary materials

Laminated cards 1.1.A.

Homework answers 1.1.B

ASSESSMENT	DIFFERENTIATION
Homework	

UNIT 1	WEATHER AND LANDSCAPES
LESSON 1.1.	ROCK LANDSCAPES

ACTIVITY 1.2. MISSING WORDS

Aim:. To set out contents of the first unit, 1.1. Rock landscapes. To introduce subject- specific vocabulary. To promote the use of the dictionary. To activate memorising skills.

30 ‘

Considerations:

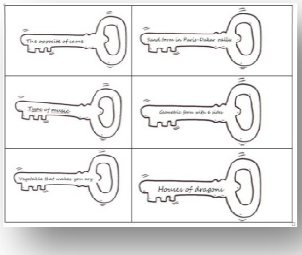
Development:

1. Hand out the student’s worksheet.
2. The students read the text for themselves.
3. They try to complete the missing words with the help of the clues or looking in the dictionary. They can ask the meaning of the words.
4. They read the text again
5. Ask students to memorize the four types of landscapes and one or two particular forms in each.

RESOURCES

Required material

Scaffolding.
Table with clue keys



Supplementary materials
1.2. Missing words (the completed text)

ASSESSMENT	DIFFERENTIATION

UNIT 1	WEATHER AND LANDSCAPES
LESSON 1.2.	WEATHERING

ACTIVITY 1.3. CHANGING EARTH

Aim:. To set out contents 1.2. of the first unit, and to start with specific vocabulary. To promote the use of the dictionary. To activate memorising skills. To encourage students to listen to short explanations in English. To listen to the pronunciation of words related with the unit.

30'

Considerations: the video starts slowly, increasing the difficulty of the vocabulary. Focus only on useful words to understand how the landscape is shaped.

Development:

1. The lesson starts with a short, easy video (8') (it's from Youtube, and it's it in one DVD)

   http://www.youtube.com/watch?v=CLFfmeirwjg&feature=fvw

2. The students fill in the table with the words provided.
3. They can check dictionaries and talk with a partner about the meaning of some difficult or new words. They can ask the teacher, as well.
4. Encourage students to use the questions and expressions in the sentence bank

RESOURCES

Required material.

http://www.youtube.com/watch?v=CLFfmeirwjg&feature=fvw
Dictionaries

Scaffolding.
Word bank.
Dictionaries
Writing frame for basic questions

Supplementary materials

ASSESSMENT	DIFFERENTIATION

UNIT 1	WEATHER AND LANDSCAPES
LESSON 1.2.	WEATHERING

ACTIVITY 1.4. **FILL IN THE GAPS**

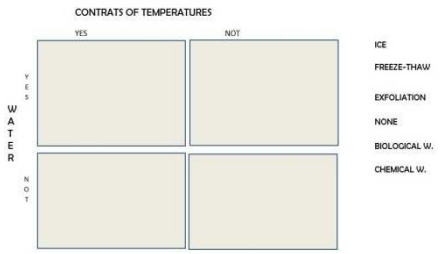
Aim:. To go deeper into point 1.2. of the content: weathering, types of weathering and erosion.
To explain some difficult weathering processes.

30 ‘

Considerations:

Development:

1. Hand out the text with the gaps.
2. Tell the students to complete the text.
3. Explain any difficult words or processes.
4. Orally, correct the exercise.
5. Individually, students sort the words inside the cells of Carroll diagram.

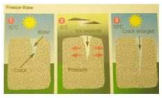


6. They compare their results with a partner.
7. Ask some pair to report their results and make all the class to correct the exercise.
8. Correct both exercises orally

RESOURCES

Required material

Scaffolding.
Laminated drawings on the walls about Freeze-Thaw, abrasion, carbonation, exfoliation and tree roots into the soil.



Optional: Write chemical reactions on the board

Supplementary materials

1.4. B. Fill in the gaps (filled text)
1.4.B. Laminated drawings

ASSESSMENT	DIFFERENTIATION
Tell students to copy the first sentence for each paragraph and memorize it for the next day	Delete the first letter for the more-able students

UNIT 1	WEATHER AND LANDSCAPES
LESSON 1.3. and 1.4.	EROSION AND TRANSPORTATION

ACTIVITY 1.5. LOOP GAME : EROSION AND TRANSPORTATION

Aim:.

30 ‘

Considerations:
If any student is unsure, just help them.
Support them by showing the diagram of transportation

Development:

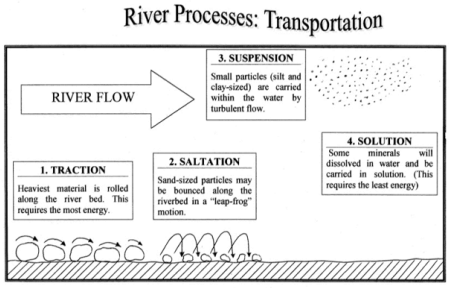
1. Make groups of 12 students and give each a card or give one card to pairs of students (24 Ss)
2. All the students play at the same time.
3. Hand out the cards randomly.
4. Choose one student to start
5. This student says: *“ I have erosion, who knows how to finish the sentence....?”* . The student reads the start of the sentence on his/her card.
6. The student who has the ending says: *“I have....., who knows....?*
7. If the pupils have answered all questions correctly then the game should go “full loop” and end up with the pupil who started.

RESOURCES

Required material

Twelve laminated cards

Scaffolding.



Supplementary materials

1.5. A. Twelve llaminated cards
1.5.B. Testing yourself

ASSESSMENT	DIFFERENTIATION
Homework Test yourself Revision: weathering, erosion and transportation	Give any easier definitions on the loop game cards to less able students

UNIT 1	WEATHER AND LANDSCAPES
LESSON 1.5.	DEPOSITION

ACTIVITY 1.6. **ORDER THE PIECES OF THE TEXT**

Aim:. To set out more contents of the first unit and extend knowledge of subject-specific vocabulary. To encourage students to work in groups and help each other. To encourage students to read aloud and to discuss with peers.

30‘ | 5 | RESOURCES

Considerations:

Development:

- You should have 5 or 6 copies of the same text.
- Cut the text provided in 5 parts
- Hand out a part of one text to each student.
- The students walk around to find 4 students with different parts of the text.
- When they are 5 with the 5 parts of the text, they can order it.
- Correct any mistakes.
- Read the text aloud.

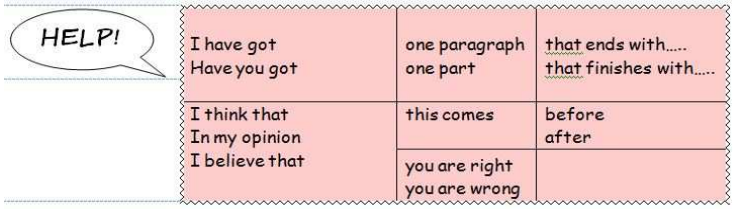
Check understanding by asking the following questions:

1. What happens when the river slows down?
2. Where are the materials deposited?
3. Which material is deposited first and which material last?
4. How are the particles classified?
5. What are the six types of particles?

Ask the students to revise all the content of the unit 1.
Hand out the homework 1.6.B.

Required material
Text cut in 5 parts
5 or 6 copies of each part of the text

Scaffolding.
Substitution table with useful questions and expressions .



Supplementary materials

Text to be cut 1.6.A.

ASSESSMENT	DIFFERENTIATION
Homework 1.6.B. Study Weathering, erosion, transportation and deposition	

UNIT 1	WEATHER AND LANDSCAPES
LESSON	REVISION OF THE UNIT

ACTIVITY 1.7. BE A GODFATHER OR A GODMOTHER

Aim:. To revise all the content of the first unit, with its subject- specific vocabulary.

30 ‘

RESOURCES

Considerations:

Development:

- Each student chooses a key word, from any part of the content of the whole unit.
- He or she writes it on a card: one side has the word and the other side the definition, if he/she wants, he/she can also make an easy drawing.
- The student keeps the card. This will be his/her word.
- Use Peer assessment by handing out 1 worksheet to each student.
- They walk around the class asking others students to define the word on the card.
- Then they say the word their partner defines.
- They tick the column which assesses their partner’s definition

- The cards can be used in different ways, depending on timing:
    a) Students walk around in a clockwise direction, the teacher says one word, and one student has to spell it, if it’s correct they go on in the same direction, if it’s wrong they change direction (it’s better to do this kind of activity when the group is small, 10-15 students)
    b) One student asks the meaning of his/her word to another, that one answers and asks for a new definition and so on….

Required material

- Scissors
- Cards
- Pens or pencils
- Dictionaries

Scaffolding.

Supplementary materials

ASSESSMENT	DIFFERENTIATION
This activity is a peer-assessment activity	

UNIT 1	WEATHER AND LANDSCAPES
LESSON	CONSOLIDATION UNIT 1

ACTIVITY 1.8. READING THE LANDSCAPE

Aim:. To consolidate the subject-specific vocabulary of the topic and to develop skills for reading a landscape. To enable students to discuss about the relevance of each particular landscape and the use of landscapes. To predict future problems and to propose solutions.

1 h. | 5

Considerations:

The pictures are provided, but you can work with your own pictures…
You can add a picture of the particular landscape in your village or region, for instance in Catalunya I would recommend presenting the Montserrat mountain picture, which shows a conglomerate landscape.

Development:

1. Make collaborative groups of 4 or 5 students randomly or choose carefully students to mix them, less able, more able, reflective, artistic-skilled, good reporters, etc. (5')
2. Give one role to each student in each group. Explain the ROLES: (5')

✓ **Facilitator/Organizer**

Makes sure that everyone understands the instructions, makes sure that all group members participate, calls the teacher if no one in the group knows the answer....

✓ **Reporter**

Takes notes of the groups answers, organizes the group presentation for the class, discusses with the group what will be reported and how, organizes the presentation

✓ **Material Manager**

Collects whatever materials are needed to complete the activity (in this case could be dictionaries, card-boards, pens…)

✓ **Planner**

Develops a time schedule for the work and keeps an eye on the time and decides when to stop.

✓ **Harmonizer**

Encourages the pupils of his group to make their contributions to the work together, encourages them to help each other and makes sure that nobody is criticized.

3. Hand out one picture to each group.
4. Students fill in the table. Set the time for completion.
5. The reporter of each group explains the landscape
6. Let students discuss some relevant aspects: possible mistakes, and use and protection of each particular place.

RESOURCES

Required material

Pictures of 5 different rock landscapes: granite, basalt, sand, karst and ……

Scaffolding.

Supplementary materials

Pictures of landscapes

Table

PICTURE NUMBER	MAIN ROOCK		
CLIMATE (if relevant)		SHOULD BE PROTECTED?	
WEATHERING	CHEMICAL	MECHANICAL	BIOLOGICAL
EROSIVE AGENT			
USE	ECONOMIC	TOURISM	GEOLOGICAL INTEREST

ASSESSMENT	DIFFERENTIATION
1.9. Students self-assess their understanding on the topic by checking out the websites provided. http://qldscienceteachers.tripod.com/junior/quizzes/geology_erosion.html http://www.softschools.com/quizzes/science/weathering_and_erosion/quiz448.html	

UNIT 2	RIVER PROCESSES
LESSON 2.1.	INTRODUCTION

ACTIVITY 2.1. LISTEN TO A SONG

Aim:. to warm up, to introduce some words related with rivers and to make students aware that rivers are very important in human life (agriculture, populations, villages, arts, cinema, etc.)

30 m. 

Considerations:
This activity can be done by the English or music teacher.

Development:

1. Students listen to the song:
   http://www.youtube.com/watch?v=2VS3s3NnNl8&feature=related
2. Then they tick the words they hear from a Word bank provided
3. They listen to the song again and fill in the gaps with the same words from the box.
4. Students classify the words according to how they are related with the words below:

RIVERS	LANDSCAPES	ABSTRACT WORDS

5. Students compare their answers to exercises 1, 2 and 3 with a partner. They have to agree.
6. Hand out the sheet with the lyrics and ask them to correct their mistakes.
7. Orally, ask the students if they like the song, the music, the lyrics and why.

RESOURCES

Required material
Internet

Scaffolding.
Writing frame

Supplementary materials
2.1. Song lyrics

ASSESSMENT	DIFFERENTIATION
	Some students may find it difficult to listen, read and write the missing song words so you can write a few of the more difficult words into the gaps before handing out the worksheet to those students.

UNIT 2	RIVER PROCESSES
LESSON 2.2.	DISCHARGE AND VELOCITY

ACTIVITY 2.2. RUNNING DICTATION

Aim:. to develop students' understanding of discharge and velocity of a river

30m. 3

RESOURCES

Considerations:

Development:

1. Show the short video silently:
 http://www.youtube.com/watch?v=hJftAYYXpVw

2. Ask students to report orally to the class some things they have seen in the video
3. Put the 9 sentences on the walls (see sentences in supplementary materials).
4. Hand out student's worksheet 2.2. To make it easier the sentences are numbered and key words that are related to the content are included.
5. Students work in groups of 3 (A, B and C), moving around the class, reading and remembering the sentences.
6. Student A has to read the sentences 1, 4 and 7. Students B read 2, 5 and 8. Students C read 3, 6 , 9.
7. Starting with student A, each student dictate their sentence to the others in the group. They finish when they complete the 9 sentences.
8. The students watch the video again.
9. Ask them the questions below, encouraging them to use the key words: (The same questions will be use as homework; less able students can do the True/false questions as homework.)
    1. What is the discharge of a river? How is it measured?
    2. Which river features increase from the source to the mouth?
    3. What factors affect the discharge?
    4. What is velocity and how is it measured?
    5. What does a Hydrograph show?
10. Hand out the homework sheet. . (S.M. 2.2.C.)

Required material

Internet

Scaffolding.

Supplementary materials

2.2.A. Sentences
2.2.B. Content
2.2.C. Homework

ASSESSMENT	DIFFERENTIATION
Homework	Homework A. less-able students Homework B, more-able students

UNIT 2	RIVER PROCESSES
LESSON 2.2.	DISCHARGE AND VELOCITY

ACTIVITY 2.3. LET'S DRAW A HYDROGAPH

Aim:.

1h.

RESOURCES

Considerations:

Development:

1. Hand out the sheet with the graph
2. Read and explain what a Hydrograph is.

After a rainstorm, the water level in a river rises, dropping back to normal once the storm is over. A Hydrograph is a graph showing the flow in a river after a storm, it shows two variables: rainfall and river discharge.
*Because rainwater takes time to flow overland and through the ground to the river, there is a delay or **lag time** for the flow to rise to its peak.*

3. Tell students to read the data at the side of the graph.
4. Explain the differences between the two tables
5. Tell them to draw the hydrograph using bars for the rainfall and a line for discharge.

6. Students answer the questions.
   a. In which units is the rainfall expressed?
   b. And the Discharge?
   c. Which day had the most rainfall?
   d. When does the discharge peak?
   e. Why is the data expressed differently for rainfall and for discharge?
   f. How long is the lag time?
   g. If the water level was very high, what could people do to prevent problems? Give them three bits of advice.
   h. Why are Hydrographs very useful for local people?

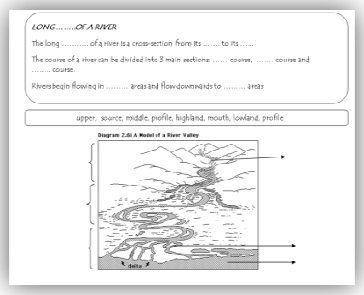
Required material
Graph language
Hydrograph

Scaffolding.
Language for describing graphs

Supplementary materials
2.3. Hydrograph
2.3.B. Graph language

ASSESSMENT	DIFFERENTIATION
	Support those students who may have difficulty answering questions e, g and h

UNIT 2	RIVER PROCESSES
LESSON 2.3.	LONG PROFILE OF A RIVER

ACTIVITY 2.4. DISCOVERING A RIVER		
Aim:. to develop students' understanding of the long profile of a river		
30 m.	6	RESOURCES
Considerations: **Development:** 1. The students work in groups (4 or 5) of 6. 2. Hand out the pieces of the text, each one corresponding to one place on the trip. 3. Ask the students to read the different pieces of the text and order them. 4. The students can help each other with the words they cannot understand. They can also use dictionaries. 5. They fill in the gaps with the words below the text and then they label the diagram.		**Required material** 4 or 5 copies of the text to cut Scissors **Scaffolding.** There is a word bank and a diagram to help understanding of the concept of a long river profile.  LONG.....OF A RIVER The long .....of a river is a cross-section from its ..... to its ..... The course of a river can be divided into 3 main sections: ..... course, ... course and ..... course. Rivers begin flowing in ..... areas and flow downwards to ..... areas upper, source, middle, profile, highland, mouth, lowland, profile Diagram 2.6i A Model of a River Valley delta **Supplementary materials** 2.4 Discovering a river (Text to cut)

ASSESSMENT	DIFFERENTIATION

UNIT 2	RIVER PROCESSES
LESSON 2.4.	RIVER VALLEY CROSS-SECTION

ACTIVITY 2.5. VALLEY CROSS PROFILES

Aim:. to be able to explain the shape of a river valley

30 m.

Considerations:

Students can use the dictionary.

Development:

1. The students look at the pictures
2. They read the Key words and in pairs discuss their meaning .
3. Make sure they understand the key words
4. They describe to a partner the pictures of the valleys 1,2 and 3, using the key words.
5. They write at least 3 sentences for each picture
6. They fill in the table.
7. They answer the question: *Which picture shows each type of valley?*

OPTIONAL ACTIVITY:
To make sure the students can spell the adjectives needed to describe a valley accurately, play a **spelling game**:

One student starts with the first letter of a word related with the topic, another one has to go on with another word and so until completing a word. One student, the writer, writes the word on the whiteboard. Make sure all the students participate.

The same can be done walking around the class (it's better if the group is not too big). They start moving clockwise and spelling one word. If it's correct, they keep going. If someone says the wrong letter, they change the direction of walking

RESOURCES

Required material
Dictionaries

Scaffolding.
Table with key words


KEY WORDS

Make sure you understand these words:

Erosion/deposition	narrow/wide
Angular/round	V-shaped/U-shaped
Steep/gentle/Flat	Downwards/sideways
Boulders/cobbles/pebbles	sand/silt/clay

Supplementary materials

2.5. Table completed

ASSESSMENT	DIFFERENTIATION
The spelling game can be used as assessment	

UNIT 2	RIVER PROCESSES
LESSON	REVISION AND ASSESSMENT

ACTIVITY 2.6. LET'S PLAY; AIRLINE AISLES / 2.7. BE A GODMOTHER OR A GODFATHER/ 2.8. SELF-ASSESSMENT

Aim:. To revise the content of unit 2. To develop students' speaking skills.

20 m.

RESOURCES

Considerations:

Development:

1. Choose 10 or 12 key words from unit 2: RIVER PROCESSES.
2. Students get into teams of 10 or 12 (the same number of words chosen) and arrange their chairs in lines.
3. Decide the time you want to spend for each word.
4. Teacher or one student stands at the front of the teams. He/She says one definition for a key word.
5. The person who is in the front seat of the line for their team, tries to call out the correct answer in the time given, to get one point for their team. He/she can ask for help to the student behind.
6. The person in the front seat for that round then moves to the back seat. Everyone else moves forward one seat. So the front row now has a new seat of competitors. Return to step 5 above.

ACTIVITY 2.7. has to be done as activity 1.7.

ACTIVITY 2.8.
Students can revise the chapter 2 of the content through this website and they can test themselves.
http://wps.prenhall.com/esm_tarbuck_escience_11/32/8320/2130030.cw/index.html

Required material

Scaffolding.

Supplementary materials

ASSESSMENT	DIFFERENTIATION
This activity 2.6. can be used as an assessment activity if you take notes of the student's answers. Activity 2.7. is a peer-assessment activity	For the groups, put less able students with more able students, so they can help each other.

UNIT 3	RIVER LANDFORMS
LESSON	3.1. RIVER BASINS

ACTIVITY 3.1. RIVER BASIN

Aim:. To develop students' understanding of river basins. To develop thinking skills, guessing, drawing. To develop accuracy in using a conversion table.

2 h.

Considerations:
Points B and F of this activity could be very difficult for the students, they have to draw, imagine a procedure, do it, calculate a surface and convert units.

Development:

TASK 1:

1. Individually the students read the text carefully.
2. They look at the Trent basin map and identify the main features: *Source, mouth,* one *tributary,* one *confluence* and *the watershed*
3. They answer the question: Which drainage pattern does the river Trent show?

TASK 2:

4. They calculate the surface of this huge river-basin by doing the following:
   A. They free-draw a random shape on a blank piece of paper
   B. Ask them to estimate the area of their shape using any method they choose.

[There are many possible methods. One is to draw the figure on grid paper, or overlay the figure with transparent grid paper, and count the squares. Another is to approximate the shape with known figures such as triangles and squares, determine the area of each, and add them.]

   C. Allow students to compare their shape with a partner and discuss how they estimated the area.
   D. After sharing with a partner, have several students share their process with the entire class.

E. They watch the video:
http://www.dailymotion.com/video/xeajqi_how-to-calculate-areas-of-irregular_tech

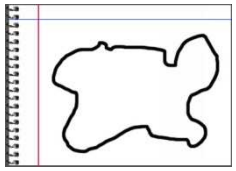
TASK 3:

F. The students calculate the area of the river basin in km^2.
G. They convert the results in $miles^2$ and in Ha, by using the table provided:

RESOURCES

Material required
Calculator
pencil and rubber
centimeter grid paper

Scaffolding.
Sample of irregular drawing



Units conversion table

METRIC		IMPERIAL
1 Km^2	100 ha	0.3861 $miles^2$
1 ha	10,000 m^2	2.4711 acres

IMPERIAL		METRIC
1 $mile^2$	640 acres	2.59 km^2
1 acre	4840 $yards^2$	4046.9 m^2

Supplementary materials

3.1. Trent river basin
3.2 Assessment rubric

ASSESSMENT	DIFFERENTIATION
Record table the personal skills at working in group in an assessment rubric	Make sure that in each pair of students one can do point B and F. Less able students don't do point G

UNIT 3	RIVER LANDFORMS
LESSON 3.2.	WATERFALLS AND RAPIDS

ACTIVITY 3.2. WATERFALLS AND RAPIDS

Aim:. To develop students' understanding of waterfalls and rapids. To improve students' reading skills. To teach how to transfer a visual information from a diagram to a sentence.

1h.


RESOURCES

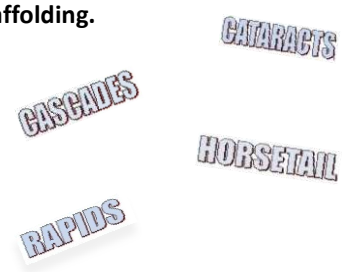
Considerations:

Development:

1. Two students read the conversation between Alba and Marc aloud
2. You read the last sentence
3. Individually, students read the text about waterfalls and rapids in the box.
4. They look at the diagram and then they order the sentences:
5. Students look in the web the description of 4 types of waterfalls: cascades, cataracts, horsetails and rapids. http://worldwaterfalls.com/waterfall_types.php
6. In pairs and they look for famous world waterfalls in the web: http://www.world-waterfalls.com/
7. They make cards for 4 waterfalls, with the name, the country and the height in English system (feet) and in metric system (meters).

Required material
Internet

Scaffolding.



Supplementary materials

3.2. WATERFALLS AND RAPIS

ASSESSMENT	DIFFERENTIATION

UNIT 3	RIVER LANDFORMS
LESSON 3.3.	MIDDLE COURSE: FLOODPLAINS

ACTIVITY 3.3. MIDDLE COURSE FLOODPLAINS

Aim:. To teach the features of the middle course of a river. To make students aware of the uses of the floodplains in agriculture, building industry, etc; to make them understand that the area around the river is still the river.

1 h | 3 | RESOURCES

Considerations:

You can have one laminated table in DINA3 empty, laminated pictures (see Supplementary materials 3.3.C.) and laminated cards to makeat the end of the lesson one big poster for the whole class. (Use Velcro or bluetag to stick the laminated cards)

Development:

Play the video (2.30')

http://www.bbc.co.uk/scotland/learning/learningzone/clips/4312/

and explain the features of the middle course of a river (10')

Then ask some students to explain the key concepts orally. (5')

Students make groups of 3. One student is the reader, another one, the organizer and the last one, the speaker. (you can give them cards with the role)

Hand out four envelops to each group:

The 4 Key words
1,2,3,4. The 4 definitions
A,B,C,D the 4 process of formation
a,b,c,d, the 4 river uses

Explain the students that for each picture there is a name, a definition, a process of formation and a possible use.

The students have 20' to match the 16 cards with the 4 pictures. The organizer has the envelops, the empty table and the glue. The organizer decides how to start and watches the time; the reader reads the cards. The whole group talk or discuss and decide the order. The speaker reports the results to the rest of the class, and answers possible questions from the other groups or from the teacher.

In plenary compare and correct the results of the different groups.

Hand out a sheet with the table completed.

Hand out the homework.

meander	fluvial terrace	ox-bow lake	floodplain
Canoeing S-shaped bends Lateral erosion	fluvial sediments changes in climate extraction of gravel	horseshoe-shaped neck of the meander vegetable plots	flat area deposition agriculture

Required material

5-10 envelops (one envelop for group)
16 cards
Glue
Bluetag (optional)
Internet

Scaffolding.

Supplementary materials

3.3.A. Cards to cut
3.3.B. Table with solutions
3.3.C. Pictures (meanders, ox-bow lakes...)
0.0.. Roles

ASSESSMENT	DIFFERENTIATION
Homework	

UNIT 3	RIVER LANDFORMS
LESSON 3.4.	DELTAS AND ESTUARIES

ACTIVITY 3.4. WHERE THE RIVER ENDS, THE BEACH STARTS

Aim:.

1h.

RESOURCES

Considerations:

Development:

1. One student read the introduction aloud.
2. In pairs. Students cut down the images and glue them to the right place on the Delta picture.
3. Then, they compare with another couple of peers and write their definition
4. They report it orally to the class.
5. Students look for a definition in a book and compare with their definition.
6. They look for the definition of estuary, as well
7. Fin ally, they compare deltas and estuaries and fill in the table.

Required material
Scissors
Glue
Delta picture
Comic

Scaffolding.
Images
Adjectives on the board

Supplementary materials
3.4.A. COMIC
3.4.B. DELTA

ASSESSMENT	DIFFERENTIATION
Exercise Revision 3.4. B.	

UNIT 3	RIVER LANDFORMS
LESSON 3.5.	FLOODINGS

ACTIVITY 3.5. FLOODINGS

Aim:. To introduce the concept of flooding. To encourage students' thinking skills. To make students conscious that all actions have consequences. To make them aware of the importance of river management.

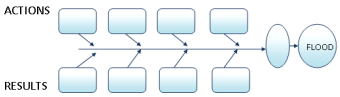
1 h.

RESOURCES

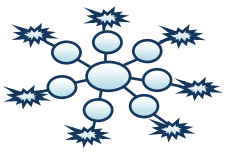
Considerations:
Use images and texts from newspapers online to introduce this activity and to show examples of the effects of the floods.
As students can produce attractive diagrams, you can do this activity as one poster to hang on the classroom walls

Development:

1. One student read the introduction aloud.
2. In pairs they write 5 -7 facts (caused by people or by natural causes) that can increase river discharge. (help students, if necessary, with some words: vegetation, urbanization, uses…)
3. They report their ideas to the class.
4. Working in plenary, they classify all the causes into actions and results (e.g. ACTION: deforestation, RESULT: less plants absorbing water).
5. They fill in the diagram:



6. Students think about the consequences of a flood. (if you prefer, you can give them a short text or some pictures from a newspaper)
7. They write one consequence in each bubble, and one example en each star



8. They write three sentences of Floods consequences, using the substitution table.
9. Finally the students discuss in pairs if Floods can produce benefits for people
10. If there is enough time, encourage the students to debate the importance of conservation of a floodplain and the management of a river.

Required material (optional)
Cardboard
Big size diagrams
Glue
colored markers

Scaffolding.
Orally, help the students with some ideas.
Substitution table to express possibility, probability and opinions.

Supplementary materials

3.5.A. Fish bone
3.5.B. Bubble diagram

ASSESSMENT	DIFFERENTIATION
	Help those students who have difficulty understanding cause and effect. .

UNIT 3	RIVER LANDFORMS
LESSON 3.6.	RIVER USES

ACTIVITY 3.6. RIVER USES

Aim:. To talk about river uses. To make students aware of the importance of rivers. To learn about uses of their local river.

1 h. | 5

Considerations:
You can end the lesson by producing an effective display, hanging the hands with fishing line.

Development:

1. Explain to the students what the video is about.
2. Show the short video silently:

http://www.youtube.com/watch?v=mcKFrdI_x74&feature=player_embedded

3. Ask students to report orally to the class some things they have seen in the video
4. Working in pairs, they write 5 uses of the river (thinking of the river next to the town (even if it's a creek), then of the main river in the province, and then of the main river in the nation.
5. Individually, they read a text about the uses of the river..
6. In plenary discuss other river uses and classify them into generic uses and examples.
7. Make groups of 5 (until 6 groups) and give them a piece of cardboard, scissors and markers.
8. One student trace her/his handprint on a piece of cardboard and she/he cuts it out.
9. In the palm they write the generic name of uses (sports, heritage, agriculture, power, wildlife).
10. They think about possible examples for their group (canoeing, herons, educational, water reservoir,...) and write one word in each finger (if necessary help them by giving some ideas
11. Then on the back, draw a picture of one example of river uses (In supplementary materials 3.6. you can find one list of river uses, but you or the students can find more ideas, and you can allow them to surf the web)
12. Each group explains to the class its hand and the examples.
13. Explain the homework 3.6.B.

RESOURCES

Required material
Internet
Cardboard
Scissors
Markers
Fishing line (optional)

Scaffolding.
If one student doesn't understand a word, the students in the group doing the presentation can explain with gestures, mime or explanations, avoiding language 1.

Supplementary materials

3.6.A. RIVER USES
3.6.B. homework solution

ASSESSMENT	DIFFERENTIATION
You can evaluate each hand for each student of the group or for each student his/her sentences.	Homework A Homework B

UNIT	EXTENSION
LESSON	

ACTIVITY 3.7. AMAZING WORLD WATER RECORDS

Aim:. To learn facts about rivers in the world. To be aware of the importance of rivers, seas, lakes ... as landmarks.

1 h. | 3 | RESOURCES

Considerations:
This activity is cross-curricular, more related with Geography than Geology, it can be done in the Geography or social class (if the teacher is confident in English). It could be also an English lesson

Development:

1. 5 students read this dialog aloud.
2. Make groups of 3 (student A, B and C)
3. They surf the web to find facts about famous rivers, waterfalls,… and they take some notes, filling in their box.
   http://www.worldatlas.com/geoquiz/thelist.htm
   http://www.world-waterfalls.com/home.php

   (If internet is not available, you can hand out photocopies of supplementary material 3.7.)
4. They complete their sentences according to the information on their notes.
5. They share their water facts with the rest of the group
6. Then, individually, they indicate one waterfall, one river, one lake and one desert on one of the two maps.
7. They must explain why the maps looks different and which was his/her option an why.
8. Explain the Homework 3.7.B. to the students. (optional)
9. Spend the time remaining playing the games:

   http://www.ilike2learn.com/ilike2learn/Rivers/Longest%20Rivers.html
   http://www.xtec.net/~ealonso/flash/eurrios1i.html

Required material

Internet

Scaffolding.

Supplementary materials

3.7. AMAZING WORLD'S WATER RECORDS

ASSESSMENT	DIFFERENTIATION
This activity is to go deeper into the rivers, it's a cultural activity and it is not necessary to use it for assessment. However, I have added Homework to consolidate important cultural facts.	

FINAL ASSESSMENT to evaluate the whole project	SUPPLEMENTARY MATERIALS
	5.4. Final assessment easy 5.5. Final assessment difficult

UNIT	LABORATORY ACTIVITIES
LESSON 4.0.	INTRODUCTION

ACTIVITY 4.0. CARRYING OUT A SCIENTIFIC EXPERIMENT

Aim:. To explain the steps of the scientific method. To develop students hypothesizing skills.

15 m.	3	RESOURCES

Considerations:

It's essential to do this activity before starting any practical activity, but when you start talking about rivers, probably, you have done a lot of activities in the lab. So, maybe you could do this activity at the beginning of the course, in your own language.

It can be supplemented by an activity to teach students how to write a report lab.

Development:

a) Students work in groups of three.
b) They look at the symbols and answer the questions.
c) They report, discuss and correct, if necessary, their answers with the rest of the class
d) They imagine one topic to discover something about it.
e) Using the same symbols, they have to describe the steps they must follow to carry out their experiment.

Required material

Scaffolding.

Supplementary materials

ASSESSMENT	DIFFERENTIATION

UNIT	LABORATORY ACTIVITIES
LESSON	

ACTIVITY 4.1. SAND: NOT JUST THE RIVER LOAD

Aim:. To consolidate content of unit 1. To motivate students. To activate manipulation, observation and drawing students' skills. To teach students how to write a lab report.

2 h. | 3

Considerations:

This activity is very motivating, however students will need a lot of new vocabulary and new procedures. They should have time to enjoy observing the sands and filling in the table. This should take one hour.
After that, you'll need another hour to enable them to write the results, to make conclusions and to report everything to the other groups. Remember that the students should clean and tidy all the equipment before leaving.
Students should have used the stereomicroscope before, but they will need time to learn how to use it properly.
Take your time!

Development:

1. Students read the three first points silently. Give them 3 minutes.
2. Allow them to ask their partners if they cannot understand.
3. Make sure they understand all the words.
4. Read the required material (equipment) and show the students each item.
5. Students read the procedure aloud, one sentence each. Show them each step by demonstrating it. Make sure they understand every step in the procedure.
6. For steps 6 and 7, write the chemical reactions on the board.
7. For step 8, show some samples of the most common minerals and rocks to the students.
   (These 7 steps will probably take half an hour)
8. Students observe 3 0r 4 samples of sand. Make sure that all the students observe all the samples under the stereomicroscope.
   (some group leaders tend to monopolize the observation)
9. They fill in the table. (30 m.)
10. (Next day) They draw some grains of sand.
11. They write down the conclusions
12. In plenary, all the groups report their results to the other groups.

RESOURCES

Required material

Samples of different sands
Samples of minerals and rocks
Stereomicroscope
Petri plate
Millimetre paper
Hydrochloric acid
Oxygenated water

Scaffolding.

a) Vocabulary required: magnifying glass, estimating, sandy grains, shiny, mica moscovite or biotite sheets, feldspath , matt, rock fragments, millimetre paper, hydrogen peroxide, sample, size, drop, organic matter
b) Chemical reactions on the word.
c) Samples of minerals and rocks.

Supplementary materials

5-1- Lab report rubric

ASSESSMENT	DIFFERENTIATION
Rubric to assess laboratory activities.	Make the groups in order that each student can do something valuable for the group, drawing, writing, thinking…

UNIT	LABORATORY ACTIVITIES
LESSON	

ACTIVITY 4.2. WHAT HAPPENS TO THE RAIN WATER?

Aim:. To revise the hydrologic cycle.

1 h.

Considerations:

This activity should be developed in the laboratory if possible, with 15 or 20 students as a maximum.

This activity is related with the second unit, so it's a good activity to revise the Water cycle and to start the Unit: River processes

Development:

1. Students watch the follow animation: (only one part or screen by screen) http://techalive.mtu.edu/meec/module01/HydrologicCycleQuiz.htm
2. Hand out the student's worksheet
3. Then, individually, students label the diagram:
4. They do the following experiment, in groups of 3:
   a) Put into the bowl a plastic sheet or any impermeable material into the bowl and tilt it slightly.
   b) Cover one half of the surface with a layer, 2-3 cm. of fine sand or a sponge (this ones used in gardening) and the other half with plasticine or modeling clay.
   c) Insert some tubes of absorbent paper (imitating trees) in the sponge or sand vertically.
   d) Water the surface of the model using a watering can, but avoid watering the "trees".
5. Students answer the question using the words from the diagram
6. One or some students read aloud the expected result.

Each group explains accurately what happened to the water in the experiment.

RESOURCES

Required material

Internet

For each group (5-6): absorbent paper, a sponge or sand, modeling clay or plasticine, a squared fishbowl or a dissection tray and water in a watering can.

Scaffolding.

The water that fell on...	the sand/ the sponge	percolated	into the ground	and it became	underground water
	the plasticine	ran off	the surface		a creek

Supplementary materials

5.1. Lab report rubric

ASSESSMENT	DIFFERENTIATION
Rubric to assess laboratory activities.	

UNIT	LABORATORY ACTIVITIES
LESSON	

ACTIVITY 4.3. LET'S GO TO THE RIVER

Aim:. To consolidate the concepts of discharge, bed load, river channel, river cross-section. To activate math skills. To encourage work in groups. To revise content of the second unit

2 h.

Considerations:
You need to choose the place of the river to carry on the activity carefully. You need to think how to get there and the time required to go there. The river should be a creek, small enough to make all the measurements without students having to walk into the river. Go to the river the day before, and check the river discharge. Even small creeks can be dangerous! Remember to have permission from parents and school to carry out activities outside.
It's essential to explain these activities to the students in advance and they need to know the personal equipment.

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1. Start explaining the importance of keeping the area clean and how to observe safety measures. Remind them that they are carrying out an experiment so they must act responsibly. (5 m.)
2. Locate the area on the map, and talk about this specific river (source, mouth, tributaries, river basin, uses…) (10 m)
3. Make groups of 3 students, assign them a role: groups A and groups B
4. Explain the instructions for each group carefully
5. Hand out all the material for each group. (15 m.)
6. Tell them to start working (make sure you can control all the groups while working). (1 h.)
7. Call all the students together in one place.
8. Fill in the results and the conclusions. (30 m.)
9. To communicate their results, as homework or back at school, each group produces a poster drawing and writes their results.

RESOURCES

Required material
EQUIPMENT:
Individual: Boots and change of clothes
For each group:
1. Base-map of scale 1:10,000 or 1:5,000
2. Calculator
3. Paper and pencil

For groups A (Cross-section area)
1. Tape measure with cm. Marking

For groups B (Velocity)
1. Stick with marks each 10 cm.
2. Length of cord
3. Small empty bottle
4. Chronometer

Scaffolding.

Supplementary materials

ASSESSMENT	DIFFERENTIATION
Evaluate the poster.	

UNIT	FINAL PRESENTATION
LESSON	

ACTIVITY 5. FINAL PRESENTATION

Aim:. To assess all the project. To activate manipulation, inquiring and drawing students' skills. To teach students how to make a poster and a PowerPoint. To improve ICT students' skills.

2 h.

Considerations:

This activity can be done at home or at the school, depending on the internet facilities or the time disposal.

Development

TO MAKE A POSTER

Students work in pairs (one more able student and one less able).

1. Give one sheet of poster paper to each group.
2. Set the time: 20 minutes to think of ideas and 30 minutes to plan then write the title and the sentences.
3. Think of a title for the poster.
4. Looking at their notebook or book they choose between 5 and 10 main ideas or facts about river features.
5. They decide which pictures they need.
6. They draw the title and write the sentences on the poster to make an effective design.
7. AT HOME! They look for the pictures in Tourist brochures or in internet
8. NEXT DAY They glue the pictures and some groups show their poster
9. Keep the poster to evaluate them according to the presentation rubric.

TO MAKE A POWERPOINT

Students work in pairs and each group has a computer.

1. Set the time:5 minutes to decide the title, 5 minutes to decide the layout, 20 minutes to think of ideas and the images and 30 minutes to make the slides (a maximum of 10 slides)
2. Think of a title and a layout for the PowerPoint.
3. Looking at their notebook or book they choose between 5 and 10 main ideas or facts about river features.
4. They decide which pictures they need.
5. Surfing the web they look for the images they need
6. They make the slides writing in each slide one idea and inserting one image.
7. They save the PowerPoint in their pen drive.
8. Practise your oral presentation at home

FOR THE PRESENTATION

It may take too much time for all the groups present their work

1. Choose 4-5 groups randomly to present their work.
2. Set a presentation time for the groups (7 minutes for PPTs and 5 minutes for posters)
3. Encourage students to give feedback
4. At the end give feedback for each presentation (don't interrupt them)

RESOURCES

Required material

- Internet (to prepare the PowerPoint)
- One pen drive for each group
- Cardboards, pencil, colored markers, scissors, glue (to make the poster)

Scaffolding.

Supplementary materials

5.4 Presentation rubric

ASSESSMENT

Evaluate the poster.

DIFFERENTIATION

Work in pairs: more able students help less able ones.