



EduTrend Contents

W4C · GEOGRAPHY & ENVIRONMENTAL STUDIES · MIDDLE SCHOOL

River Investigators

Model erosion, transport and deposition

Ages 11–14

Level: Intermediate

60 minutes

Groups of 3 · up to 30

Activity 03

Inside: activity at a glance · step-by-step session plan · facilitator notes · 3 student worksheets · assessment checklist

ACTIVITY 03 · AT A GLANCE

River Investigators

Students build a stream table from a tray of damp sand, run water down it and observe how a channel forms, meanders and deposits sediment. They change one variable, such as slope or flow rate, and measure the effect on erosion and deposition.

Learning outcomes

By the end of the session students can:

- describe erosion, transportation and deposition by rivers;
- explain how slope and discharge affect river processes;
- plan and carry out a fair test on a physical model;
- relate model features to real river landforms.

KEY WORDS

erosion · transportation · deposition · meander · delta · gradient · discharge · sediment · model

CURRICULUM LINKS

Geography: physical processes and landforms of rivers. Science: variables and fair testing. Geography for Life (2012), standard 7.

1**ASK**

What is the question?

2**LOCATE**

Find it on a map

3**OBSERVE**

Look in the field

4**MEASURE**

Collect data

5**ANALYSE**

Spot patterns

6**EXPLAIN**

Why here?

Materials (per group)

- Large shallow tray or guttering, with a drain hole at one end
- Damp sand (fine and coarse mixed)
- Water container with a small hole, or a jug for steady pouring
- Blocks to change slope; protractor
- Bucket to collect outflow; ruler; timer
- Worksheets 1, 2 and 3

Before the session

- Set up trays on protected tables or outside, with buckets at the lower end.
- Test a water container that gives a steady trickle.
- Mix sand so it is damp but not waterlogged.
- Prepare photos of real meanders, deltas and valleys.

SAFETY

Mop spills immediately to prevent slips. Keep water away from electrical sockets. Wash hands after handling sand.

ACTIVITY 03 · SESSION PLAN

Step by step

Ask students to sketch the tray before and after each run. The drawings become the main evidence.

Time	What happens	Say or ask
0–10 min Hook	Show aerial photos of a meandering river and a delta.	<i>"How did the river make these shapes?"</i>
10–20 min Set up	Groups shape a flat sand surface, set a low slope and sketch it.	<i>"What do you predict will happen?"</i>
20–35 min Run 1	Pour water steadily for 2 minutes; observe and sketch channel shape and deposits.	<i>"Where is sand being removed and where is it dropped?"</i>
35–50 min Run 2	Change slope or flow; repeat and measure channel width, depth and delta length.	<i>"What changed, and why?"</i>
50–60 min Link	Match model features to photos of real landforms.	<i>"How is the model different from a real river?"</i>

CHALLENGE CARD (print or copy onto the board)

Use the stream table to find out how slope affects erosion and deposition, and explain your results using real river examples.

ACTIVITY 03 · FACILITATOR NOTES

The geography in brief

Rivers erode material from their bed and banks, transport it downstream and deposit it when they slow down. Faster flow, caused by steeper slopes or more water, carries more and larger sediment. On bends, water flows faster on the outside, eroding it, and slower on the inside, depositing sediment, which is how meanders grow.

Stream tables compress thousands of years into minutes, so they show processes clearly but exaggerate speed. Real rivers also depend on rock type, vegetation, climate and human activity. Deltas form where a river enters still water and drops its sediment.

Common ideas to listen for

- “Rivers only erode.” They also transport and deposit sediment.
- “Meanders stay still.” They migrate over time as banks erode and build up.
- “A model is the same as reality.” Models simplify scale, time and materials.

Adapting the activity

Support

Provide a partly completed observation table and label cards for erosion, transport and deposition.

Stretch

Measure sediment collected in the bucket for different slopes, plot a graph and describe the relationship.

WORKSHEET 1

Plan and predict

Name: _____

Class: _____ Date: _____

Plan your fair test.

Variables

Variable	What we will do
Independent (change)	
Dependent (measure)	
Control (keep the same)	

Prediction

WORKSHEET 2

Observations

Sketch and measure after each run.

Sketches

Draw the tray from above after run 1 and run 2. Label erosion and deposition.

Measurements

Run	Slope (°)	Channel width (cm)	Delta length (cm)
1			
2			
3			

WORKSHEET 3

Model and reality

Link your model to real rivers.

What we found

Real landforms our model showed

Limitations of the model

FOR THE TEACHER

Assessment checklist

Use during the session. One sheet covers up to eight students; copy as needed.

Student	Describes river processes	Carries out a fair test	Evaluates the model

Suggested codes: W = working towards · E = expected · G = greater depth

ABOUT THIS ACTIVITY

River Investigators is a sample activity from the EduTrend Contents W4C Geography & Environmental Studies programme (middle school, level: intermediate). Every activity in the programme follows the same format: a practical challenge, a clear session plan, facilitator notes and ready-to-print worksheets, so that teachers, club leaders and parents can run it without extra preparation.

Full 15-, 20- and 32-week programmes are available from EduStore at edutrend.org.

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