

Science – River rocks!

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Number of lessons: 1

Year Level(s): Year 8

Australian Curriculum content

descriptions:

Sedimentary, igneous and metamorphic rocks contain minerals and are formed by processes that occur within Earth over a variety of timescales (ACSSU153)

Achievement standard:

By the end of Year 7 students explain how biological diversity is ordered and organised.

Lesson 1 – The Mighty Gilbert River

Context

The lands of the Ewamian People are shaped by many rivers, cutting through rocks that are billions of years old. While we may think of rivers as gentle flows of water, they can be violent places where rocks are both formed and destroyed.

Materials and equipment

- Computer/Projector

Safety Advice

nil

Objectives

Students can consider how rivers may help form sedimentary rocks by moving and depositing sediments, while also weathering and eroding all types of rocks through the movement of water.

Introduction

May 2022 in Rungulla National Park was unseasonably wet. The BushBlitz camp was inundated with 200 mL+ rainfalls halfway through the expedition. When we arrived the landscape was dry and unforgiving, with empty rivers filled with sand snaking across the landscape. We were all shocked with how quickly those rivers become raging torrents of deadly, muddy water.

Core

Engagement

Use Google Maps to explore the area between Forsayth and Esmeralda in North Queensland (using the satellite photo layer). The Gilbert River is the largest river in the area, flowing north and west out to the Gulf of Carpentaria. Ask students to remark on any features they observe in the satellite imagery and ask if they can think of any explanations for what they can see.

Focused Instructions

Provide the following information to students:

- Deposition – this is where small grains of rock are carried by wind, water or other forces and then dropped. If lots of grains are dropped in the same place, they build up into large piles and layers that we call sediments. Over time these sediments may be exposed to heat and/or pressure, which “glues” them together into sedimentary rocks like sandstone, clay or limestone.
- Weathering – this is where rocks are broken down. This could be caused by rock particles hitting the rock in flowing air or water, by chemicals in the rain, or even by ice forming in cracks. In rivers, weathering is usually caused by rocks being washed around and hitting each other as they are pushed by the river water.
- Erosion – this is where grains of rock are removed from their original location. In a river, weathering may break a rock apart, but the flow of the water will cause erosion by washing those broken pieces down stream.

Guided Instructions

The teacher should display the following image and discuss whether they think deposition, erosion and/or weathering are occurring:

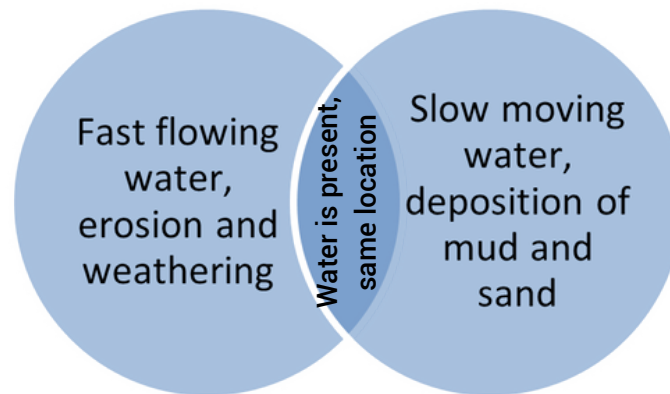


Hint: The water in the Gilbert River in this photo is flowing too quickly to drop any particles of rock, so this is erosion. Weathering is occurring as the sand and grit hits the bigger rocks in the middle of the river, slowly wearing them down.

Collaboration

Students should then view both of the following photos and compare what forces they think are in action in both photos. These photos were taken 20 meters from each other. They should then create a 2-Venn diagram to compare and contrast the two photos (in a rock formation context):





Independent

Students consider the following photograph taken two days before the two above, 2 km downstream:



Students attempt to predict this area will look like in a million years. Will it be covered in mud and sand which has turned into sandstone? Or will be all weathered and eroded away? Give justification.

E.G. "I think that this place will be weathered and eroded away. I think this because every time it floods then more of this sand will get washed away and will hit any big rocks in the river, making them smaller. Eventually all this sand will be washed away."

Conclusion

The geology of the Australian outback is dynamic and always changing. While we might make predictions about whether deposition and sedimentation might be more prevalent than weathering and erosion, it is impossible to tell what the future will bring.

Resources

Digital:

<https://goo.gl/maps/hxZ5LbhwbirTCgaa9>

Worksheet:

nil

Useful links:

nil