

Practical work: Investigate the way water works on a cliff

You will need a bucket, some stones, water and an old plastic chair for this work. You should do this in the school playground or somewhere else where water can be splashed without causing damage.

The ability of a wave to cause damage to a cliff depends on two things: the amount of water and the speed it is moving. You are going to find out about the power of this moving water.

1. Fill a bucket with water and pour it over the chair. Although the chair will get wet, the water will not cause much change because the water does not have much speed.

2. Fill the bucket again and then throw the water against the side of the chair. (This is a model of a wave hitting a cliff.) What happens?



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3. Put some stones into the bucket and fill it with water again. Now throw the contents of the bucket against the side of the chair. (This is a model of a wave carrying pebbles hitting a cliff.) What did you notice?



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Answers

2. **The chair will be knocked over.**
3. **The stones and water will knock over the chair, and then the stones will continue travelling on their own.**

Notes

The objective is to show that the energy of moving water is high. The water has a large weight (mass) of its own, but when simply poured out slowly, it has little energy. (Energy in movement is proportional to mass multiplied by the square of the velocity.)

When the bucket of water is thrown at the side of the chair, the chair will be knocked over. This is very messy, so arrange for it to be done in a large, empty space. But the effect is dramatic and explains all manner of things related to moving water. Children could be asked to imagine themselves in the path of moving water of this kind. They would be bowled over if the water was high, and knocked off their feet if the water was low.

From this children can readily understand the power of moving water.

The purpose of adding stones is to show that the stones have a momentum of their own and can easily be carried by water. When the bucket of stones and water is thrown, the stones will travel with the water. This is a common experience of stones being thrown against the cliff, causing abrasion. Children can also see that because so much of the weight of the stones is taken up by the water (this can be linked to the buoyancy effect in the study of Forces in the science curriculum), even large stones and boulders can be carried by waves.