

Replica Rocks – Student Activity



Replica conglomerate (left), breccia (top) and sandstone (right)

To make a mould

Lightly fill an old container or tray with damp sand or soil. Push down firmly to form a mould for the rock. The surrounding sand will stop wet rock from bonding to the container.



Alternatively make a rock sized depression in damp soil in the garden or yard.

Replica conglomerate

Conglomerate is made of large rounded unsorted clasts that are cemented by a finer matrix of sand.

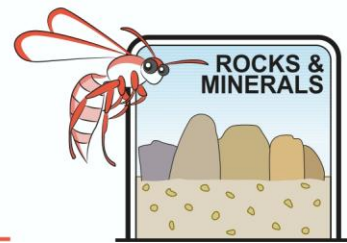
Clasts

- Rounded pebbles

Matrix

- Cement (1 part) + sand (3 parts) + water
- Optional grout to colour matrix





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1. Make rock sized depressions in damp sand or soil and partially press rounded pebbles into the sand
2. Mix matrix of sand (3 parts), cement (1 part) and water to a thick mix.
3. Add grout colour, if you wish
4. Pour matrix into the depression making sure not to displace pebbles
5. Place remaining pebbles on top and press gently in
6. Leave to set for 24 hours
7. Remove, leave to dry and brush away excess sand/soil

Replica breccia Clastic sediment

Breccia is made of angular unsorted clasts set in a sandy matrix. Repeat process for conglomerate using angular clasts.



Replica sandstone Clastic sediment

Sandstone is made of beds of sands in a finer matrix. Use different coloured layers to replicate bedding.

- Sand. The sand can be of different colours and clast size.
 - Cement (1 part) + sand (3 parts) + water
 - Grout colouring
1. Mix the sand, cement and water to make a stiff mix
 2. Pour a thin layer (about a quarter) of the mix into the depression.
 3. Add a little colouring and pour another layer of the mix.
 4. Sprinkle a layer of sand round the edge of the underlying cement
 5. Add more colour and pour the rest of the mix
 6. Leave for 24 hours to dry and brush away excess sand or soil



Replica Limestone Biogenic sediment

Biogenic limestone is formed from cemented calcareous fragments of living things such as shells and coral.

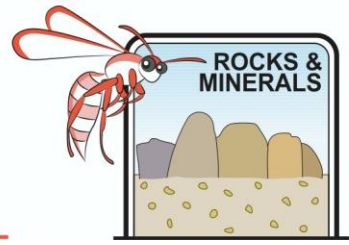
Fossils

- Shells (sea shells or land snail shells)

Matrix

- Pale yellow coloured mortar or white sand and cement
- Water





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1. Press some shells into the sand mould
2. Add some mixed mortar
3. Sprinkle most of the shells on top of the mortar layer
4. All the rest of the mortar
5. Sprinkle remaining shells on top
6. Leave 24 hours to dry then remove and brush away excess sand and dirt

Physical facts about replica rocks

The mass of an object is a measure of _____

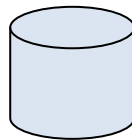
Which object has the greatest mass?



1kg iron



2kg lead



0.5kg water

The volume of an object is a measure of _____

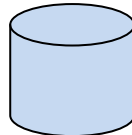
Which object has the greatest volume?



1kg iron



2kg lead



0.5kg water

The density of an object is a measure of _____

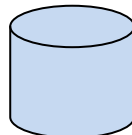
Which object has the greatest density?



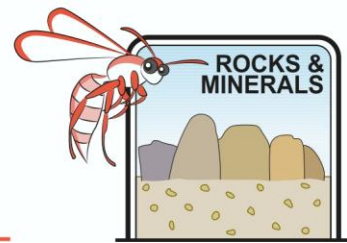
1kg iron



2kg lead



0.5kg water



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You shall measure the density of your replica rocks and compare your findings with those of others.

Scientists only accept data that is:

O _____

M _____

R _____

Materials required per student or group

To measure mass

- Triple beam balance or weighing machine
1. Select units of measurement that are appropriate.
 2. Place the rock on the pan and weigh.
 3. Repeat twice and find the average mass. Enter this in the table provided.

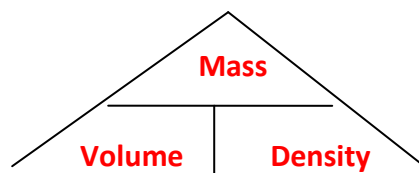


To measure volume

- Beaker filled to the brim with water
- Measuring cylinder

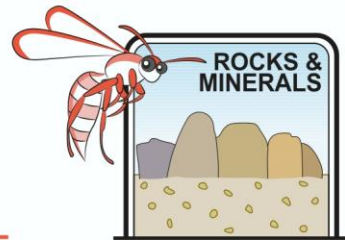
Since rocks are not regular geometrical shapes we can estimate their volume by the amount of water they displace.

1. Gently place the rock into the beaker full of water and collect the water it displaces in the measuring cylinder. The volume of water in the cylinder is the same as the rock
2. Repeat twice and find the average volume. Enter this in the table provided. (Don't forget to write down the units!)



To estimate density

Divide the average mass by the average density. (Don't forget to write down all the units!)



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	MASS				VOLUME				DENSITY
	1	2	3	Average	1	2	3	Average	
Breccia									
Conglomerate									
Sandstone									
Limestone									

Rate your rocks from densest to least dense _____

Compare your results with those of other class members. Which rocks had the greatest range of densities?

Why is this so? _____

Would you expect this to happen with real rocks? _____
