

Rationale:

Students will investigate how various materials can be mixed together for specific purposes. They will examine how palaeontologists measure and combine water and plaster together to make hard replica casts of fossils, including ancient footprints and fossilised impressions. Through carefully following written instructions, they will make their own plaster casts of different objects (e.g. toys, shells, fossils or their fingers). They will make observations and predictions regarding how quickly plaster will dry over several hours.

Students will be engaged by activities suited for various learning preferences, with new information processed with the use of visual sources (e.g. watching videos on fossil formation) and kinaesthetic-based investigations (e.g. making casts of by measuring and mixing plaster and water). Students will also enjoy decorating their casts with paint.

Learning Outcomes:

Cognitive:

Students will:-

1. Determine that plaster and water can be mixed together to make hard casts.
2. Comprehend that plaster will only set over time when the correct amounts of water and plaster are mixed together.
3. Learn that fossils include the remains or traces (e.g. impressions) of ancient plants and animals.
4. Understand that palaeontologists can study fossil impressions by making hard replica casts.

Affective:

Students will:-

5. Enjoy mixing plaster and water to make hard casts of fossils.
6. Anticipate discovering whether their plaster casts have set.
7. Enjoy watching videos on fossil formation.
8. Appreciate painting their plaster casts of fossils.

Procedural/Skill:

Students will:-

9. Refine their skills in measuring amounts of plaster and water.
10. Improve their ability to follow instructions containing multiple steps.
11. Improve their communication skills through sharing with the teacher and fellow students.

Resources:

Activity Sheets, Plaster of Paris, water, paper cupcake cases, plastic cups, spoons, clay and objects to cast (e.g. shells or toys).

Suggested YouTube clips:

1. 'How fossils are formed'

<https://www.youtube.com/watch?v=TVwPLWOO9TE> – (cartoon on different types of fossil formation).

2. 'What is a fossil'

<https://www.youtube.com/watch?v=PzwcoAxFgyY> - (introduction to fossils).

For further information, please go to www.kronosauruskorner.com.

Procedure:

Engagement:

The students will be asked if they have ever heard of plaster and how it is used for different purposes, such as building walls and making protective casts for broken bones. The teacher will show a variety of different plaster casts of shells, bones, footprints or dinosaur toys. The teacher will explain how palaeontologists use plaster to make hard replica casts of fossils including body impressions and footprints. Video clips featuring different types of fossils will be played (YouTube clips 1 and 2). The teacher will explain how the class will make their own hard replica casts of objects by mixing together plaster powder and water.

Lesson steps:

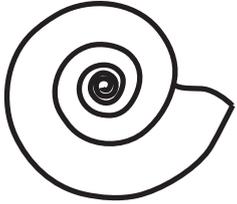
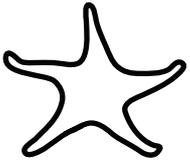
1. The teacher will hand out the Activity Sheets and read through the steps with the students.
2. The students will be asked to select an object to cast - such objects could either be supplied by the teacher or brought in by the students (if so, give notice to the students prior to the lesson).
3. Following directions from their teacher, each student will collect a paper cupcake case and write their name on the bottoms. They will press two to three centimetres of clay into the cases, making sure that the edges are firmly filled.
4. The students will then press their selected objects into the clay in the centre of the cases. Objects must be removed gently to ensure that the imprints are clear for casting.
5. The students will each collect a plastic cup and to fill it with eight spoons of plaster and four spoons of water.
6. The students will mix the plaster and water in their plastic cups with their spoons and pour the mixture into their cupcake cases. The plaster-filled cupcake cases should be gently tapped on table tops to remove any air bubbles.
7. Placing their plaster-filled cupcake cases in a safe place, the students must wait for their mixtures to dry (this could take several hours depending on the temperature). Plastic cups and spoons will be cleared away.
8. The teacher asks students whether they think the mixtures will be dry by the end of the day/lesson. This can be tested by gently touching the top of the mixtures.

Conclusion:

9. Once the mixtures are dry, the students will peel away their cupcake cases and gently remove the surrounding clay from their hardened plaster casts. The students will be asked to compare differences between their casts and the original objects, and why palaeontologists might study casts instead of original fossils (answer: original fossils may be rare or too fragile to be handled).
10. The teacher will recap the major points from the lesson, including that materials can be mixed together for specific purposes and that plaster replica casts can be made of fossils.

Optional extension activities:

Students will decorate their plaster casts with paint. Decorations could either replicate the original colour of the objects or represent the colour of an ancient organism in life.



HOW TO MAKE A PLASTER CAST OF AN OBJECT OR FOSSIL

What you need

Plaster of Paris, water, paper cupcake cases, plastic cups, spoons, clay and objects to cast (e.g. shells, leaves, figurines or dinosaur toys).

Steps



1. Select a small object to cast - this could either be a toy, bone, shell, leaf, coin or something else.
2. Collect a paper cupcake case and write your name on the bottom. Gently press two to three centimetres of clay into the bottom of the case, making sure that the edges are firmly filled.
3. Carefully press your object into the clay in the centre of the case. Gently remove your object to make a clear imprint for casting.
4. Collect a plastic cup and to carefully fill it with eight spoons of plaster and four spoons of water.
5. Mix the plaster and water in your plastic cup with the spoon and pour the mixture into your cupcake case. The plaster-filled cupcake cases should be gently tapped on a table to remove any air bubbles.
6. Place your plaster-filled cupcake case in a safe place and wait for your mixture to dry. This could take several hours depending on the temperature.
7. Clean away any plastic cups, spoons or spills.
8. Once the mixture is dry, peel away your cupcake cases and gently remove the surrounding clay from the hardened plaster casts.
9. Compare differences and similarities between your casts and the original objects.
10. Decorate your plaster cast with paint.