

GOLD RUSH GEOLOGY

WARNING — THIS SET CONTAINS CHEMICALS THAT MAY BE HARMFUL IF MISUSED. READ CAUTIONS ON INDIVIDUAL CONTAINERS AND IN MANUAL CAREFULLY. NOT TO BE USED BY CHILDREN EXCEPT UNDER ADULT SUPERVISION.

1ST EDITION 2014

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PRINTED IN TAIWAN / IMPRIMÉ EN TAIWAN



SAFETY

Safety Rules

Read these instructions before use, follow them and keep them for reference.

Keep young children, animals and those not wearing eye protection away from the experimental area.

Always wear eye protection.

Store this experimental set out of reach of children under 7 years of age.

Clean all equipment after use.

Make sure that all containers are fully closed and properly stored after use.

Ensure that all empty containers are disposed of properly.

Wash hands after carrying out experiments.

Do not use any equipment which has not been supplied with the set or recommended in the instructions for use.

Do not eat or drink in the experimental area.

Do not allow chemicals to come into contact with the eyes or mouth.

Do not replace foodstuffs in original container. Dispose of immediately.

First Aid

In case of eye contact: Wash out eye with plenty of water, holding eye open if necessary. Seek immediate medical advice.

If swallowed: Wash out mouth with water, drink some fresh water. Do not induce vomiting. Seek immediate medical advice.

In case of inhalation: Remove person to fresh air.

In case of skin contact and burns: Wash affected area with plenty of water for at least 10 minutes.

In case of doubt, seek medical advice without delay. Take the chemical and its container with you.

In case of injury always seek medical advice.

CAUTION!

For plaster (gypsum):

May cause eye and skin irritation.

Avoid breathing dust. Do not get in eyes, on skin, or on clothing.

Wash hands thoroughly after handling. Do not ingest. Use only as instructed.

WARNING!

Not suitable for children under 3 years.

There is a risk of choking due to small parts that can be swallowed or inhaled.

Keep the packaging and instructions, as they contain important information.

EXPERIMENT: PANNING FOR GOLD

1. Break the plaster block into a few chunks and put them in the black pan. The plaster represents silt from a riverbed.



2. Fill a sink or large basin with water. Submerge the pan containing the plaster chunks in the water.

3. Carefully agitate (or slightly shake) the pan and the plaster chunks until they break apart completely. The plaster will disintegrate into a fine silt. Try to keep as much of the material in the pan as possible while it breaks apart.





4. Continue to move the pan under the surface of the water. Now the light silt will wash out of the pan over the sides. You will notice some heavier nuggets in the bottom of the pan. You may want to help the silt move out of the pan faster by splashing it away.

5. Once all of the silt has washed away, empty the sink or basin. The golden nuggets should have remained in the bottom of your pan. You can remove them with the tweezers, inspect them, and store them in the small cup.



ABOUT PANNING FOR GOLD

Gold **panning** is a type of **placer mining** (see next panel) in which a pan is used to find and remove gold from placer deposits. It is one of the easiest, least expensive, and least destructive ways of extracting gold from the Earth.

Panning for gold is a very old process. Records of gold panning date all the way back to ancient Rome. In those days, gold and other metals were panned out of streams coming down mountainsides. The Romans set up **sluices**, or special channels for the water the flow through, to make the process easier.

Today, panning has been replaced by much more complicated mining techniques that use more heavy equipment and go deeper into the Earth.



Placer mining is the extraction of desirable materials from loose, unconsolidated soil or sediments that have been created by **weathering and erosion**, which is the slow breaking-down and transporting of soil and rock. These deposits of minerals are called **alluvial deposits**.

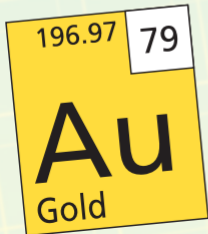


Placer mining most often occurs in rivers and streams, on the shores of bodies of water, in old dried-up riverbeds, and even in deposits left by glaciers. Miners are most often looking for gemstones and precious metals. Since these minerals are more **dense** and heavier than the soil and sediments of the deposits, they sink to the bottom. It is this property that makes panning possible, as you saw in your experiment.

The original source of the precious minerals is called a **vein**, or a ribbon of the minerals that formed deep in the Earth but that has moved to the surface over time.

THE ELEMENT GOLD

Gold is a chemical **element** found on the periodic table of elements. This means that in a bar of pure gold, all of the atoms are exactly the same. Gold is **dense**, which means that if you had the same volume of gold and other materials, the gold would be heavier. Gold is also **malleable** and **ductile**, which means it can be bent and shaped into many shapes and also pulled into thin wires without breaking. In fact, gold is so malleable that a single gram of gold can be flattened into a sheet one square meter in size. Gold can be made so thin that it is transparent and lets light pass through!



Gold is very stable chemically, meaning that compared to other elements, it does not react with many things. This is why pure gold exists in the Earth, and why panning for gold is possible. Some other elements are so reactive that they are almost never found outside of compounds with other elements.