ARCHIMEDES AND THE KING'S CROWN

Resources Source A

The Greek king was in a rage: he shouted, banged the table and threw his golden goblet at the cat. The cat howled and shot out of the room. What a mess, thought the king. The chief of police had just caught the king's goldsmith putting gold and copper into a metal cauldron that stood on the fire – the same cauldron the goldsmith had used to melt the gold for the king's new crown! The goldsmith now stood quaking in front of the king.

The goldsmith croaked
"It's a lie your majesty – I was making a new crown for a foreign king. To be sure, your majesty, on my life, your crown is made from solid gold. I was going to use the gold I saved from the new crown to add to the next crown that I made for you, to be sure."

'Liar!' screamed the king. He was certain that the goldsmith had cheated him. But, how could he find out if the great golden royal crown was pure gold? Of course! Only one man could solve the problem, Archimedes the scientist.

At once the king sent a message to Archimedes to come to the palace. When the messenger arrived Archimedes was singing in his bath. A servant brought the king's message to Archimedes. Archimedes slumped into the bath, thinking hard. As he climbed out of the bath he shouted 'Eureka!' a Greek word that meant, 'I have solved it'. Archimedes had cracked the problem of whether the crown was solid gold or not.

Archimedes got a horse and cart, and told his servant to put on it:

Some nuggets of pure gold, borrowed from the king's old goldsmith, who had retired and now lived near Archimedes
A large bowl
A balance for comparing the weight of different items (Greek scales)
A large water jug
A smaller measuring jug to measure a tiny volume of water

[The crown was of course at the palace]

Q How did Archimedes prove that his solution to the problem was right? Can you work out how he solved the problem?