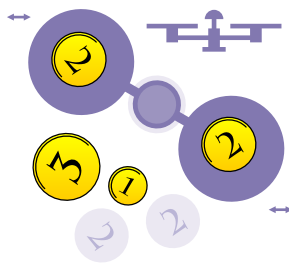
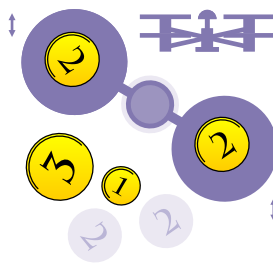




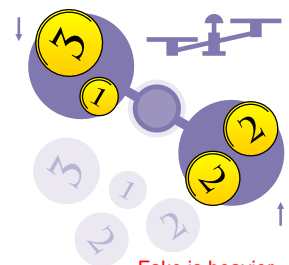
This is the same problem as Buckazoid Arithmetic – Basics except that someone has given you one 1-buckazoid coin, two 2-bucazoid coin, and one 3-buckazoid coin. One of them is fake – it doesn't weigh what it should – but you don't know whether it is heavier or lighter than a real coin. How can you find the fake coin by using only a pan balance? You have no other weights except for these four coins.



A1 Result of the weighing 1

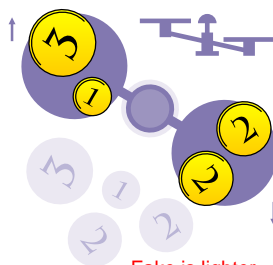


B1 Result of the weighing 2



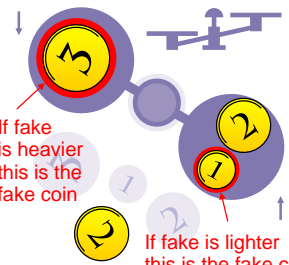
Fake is heavier

A2 Result of the weighing 2



Fake is lighter

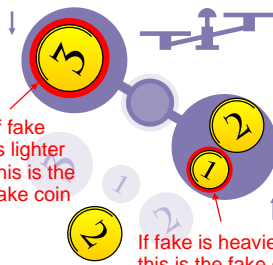
A3 Result of the weighing 2



If fake is heavier this is the fake coin

If fake is lighter this is the fake coin

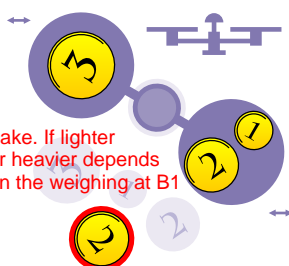
A4 Result of the weighing 3



If fake is lighter this is the fake coin

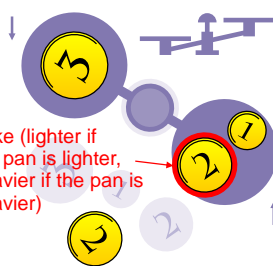
If fake is heavier this is the fake coin

A5 Result of the weighing 3



Fake. If lighter or heavier depends on the weighing at B1

B2 Result of the weighing 3



Fake (lighter if the pan is lighter, heavier if the pan is heavier)

B3 Result of the weighing 3

Step 1. Compare the two 2-buckazoid coins. They either balance (diagram A1) or they don't (diagram B1). We treat each possibility differently. If they balance, go to step 2, if they don't balance, go to step 3.

Step 2. We know that both 2-buckazoid coins are real, so the fake one is either the 1- or the 3-buckazoid coin. Weigh the 1-buckazoid and the 3-buckazoid coin against the two 2-buckazoid coins. Obviously, they won't balance. We now know whether the fake is too heavy (diagram A2) or too light (diagram A3). Now put the 3-buckazoid coin in one pan, and one of the 2-buckazoid coins and the 1-buckazoid coin in the other. If the fake is lighter, then the lighter pan contains the fake - this is the 3-buckazoid coin in diagram A4 and the 1-buckazoid coin in diagram A5. If the fake is heavier, then the heavier pan contains the fake - this is the 1-buckazoid coin in diagram A4 and the 3-buckazoid coin in diagram A5.

Step 3. One of the 2-buckazoid coins is fake, and both the 2- and 3-buckazoid coins are real. Put the 3-buckazoid coin in one pan, and one of the 2-buckazoid coins and the 1-buckazoid coin in the other, and this will tell which of the 2-buckazoid coins is fake. If both pans balance, then the remaining 2-buckazoid coin is the fake - diagram B2 (from remembering the result of the weighing in diagram B1 we can say if the fake is lighter or heavier). If the pans don't balance, the 2-buckazoid coin in the pan is the fake (diagram B3) - in case the pan is lighter the fake is lighter, and in case the pan is heavier the fake is heavier.