NAME(s): _____ ID(s):_____

Three-Pan Duplication

There are two counterfeits among nine identically looking coins. The seven genuine coins all weigh the same. The two counterfeits weigh the same but are slightly heavier than the genuine coins. You have a **three-pan** balance at your disposal, but no other weights except for the coins themselves. You also have the ability to duplicate a single coin once. A genuine coin or a counterfeit coin can be duplicated; but the duplication process does not tell you if the coin is counterfeit or not. Identify the two counterfeit coins with the smallest number of weighings using the three-pan balance.

In a three-pan balance, the heaviest pan is lowest, the lightest pan is highest, and pans of the same weight are at the same level.

Therefore the smallest number of weighings needed is: ☐