

## An exercise

An aim of this task is to make right calculations to prepare a mixture to the Polymerase Chain Reaction (PCR).

1. Prepare the reaction mixture for 3 tries (2 samples + negative control). Reaction mixtures can be prepared simultaneously that's why make right calculations of individual reagents for all 3 tries. In the table below fields needed to make the right calculations have been featured. Obtained value of the total MMix volume has to be divided by a number of tries. Obtained value is the volume of reaction mixture which needs to be portioned to individual tubes. It should be consistent with the sum of ingredients counted to MMix intended for the sample.

Reagent	Quantity in $\mu\text{l}$	Quantity for 3 tries (MMix)	Sum in $[\mu\text{l}]$	Portioned into $[\mu\text{l}]$
Water to PCR	31			
10 × PCR reaction buffer	5			
Mg $\text{Cl}_2$ [50 mM]	2			
Solution dNTPs [8 mM]	5			
Starter 1 [10 $\mu\text{M}$ ]	2			
Starter 2 [10 $\mu\text{M}$ ]	2			
DNA thermostabile polymerase	1			
matrix DNA (a test sample)	2			
Final volume	50			

2. Ingredients of the mixture have to be added to one tube in order featured in the table and in quantities calculated for MMix. It has to be mixed in the tube with a pipette and then portioned to 3 tubes to PCR.

The task above requires accuracy, focus, having skills of making simple mathematical calculations and skills how to use lab equipment. This is the exercise that needs to be done individually, so recommended for people who prefer independent performance of entrusted tasks. If you have such skills, you will find yourself in occupations like: lab diagnostician, geneticist, pharmacist, biotechnologist, chemist.