Measure:

Measure is important because physics is about measure, which means checking the theories using the experiments. The uncertainty principle is important in physics, this means that it is impossible to measure everything absolutely precisely due to the disturbing the physical system with the act of measure as well as due to the imperfections of the equipment, devices, our knowledge and theories.

Accuracy and precision analysis is part of the measure. Precision means that all results are close to each other and accuracy means that the results are close to the true value of the physical quantity.

Significant figures give us the accuracy and precision of the physical quantity.

Error analysis allows estimating the errors of compound measures. Error is often normally distributed. Systematic error has a lot to do with accuracy. The compound error is approximated using formulas similar to derivatives and differentials.

Dimensional analysis helps to avoid mistakes white calculating physical quantities.