Validation:

How do we know if our model is functional? If we have trained it well? All of this can be determined by seeing how our model performs on previously unseen data, data that is completely new to it. We need to ensure that the accuracy of our model remains constant throughout. In other words, we need to validate our model.

Using cross-validation in [machine learning](https://www.simplilearn.com/tutorials/machine-learning-tutorial/what-is-machine-learning), we can determine how our model is performing on previously unseen [data](https://www.simplilearn.com/what-is-data-article) and test its accuracy.

Why Do Models Lose Stability?

Any machine learning model needs to consistently predict the correct output across a variation of different input values, present in different datasets. This characteristic of a machine learning model is called stability. If a model does not change much when the input data is modified, it means that it has been trained well to generalize and find patterns in our data. A model can lose stability in two ways:

1. Underfitting: It occurs when the model does not fit properly to training data. It does not find patterns in the data and hence when it is given new data to predict, it cannot find patterns in it too. It under-performs on both known and unseen data.
2. Overfitting: When the model trains well on training data and generalizes to it, but fails to perform on new, unseen data. It captures every little variation in training data and cannot perform on data that does not have the same variations.

The figures depicted below show unfit, overfit, and optimally fit models: