Artificial Neural Networks (ANNs) are computational models inspired by the structure and functioning of the human brain. ANNs consist of interconnected nodes, or artificial neurons, organized into layers. The three main types of layers are the input layer, hidden layers, and output layer. Each connection between neurons has an associated weight, and the network learns by adjusting these weights during a training process.

Key components of ANNs:

1. **Neurons:** Mimic biological neurons and process information.
2. **Layers:** Input layer receives data, hidden layers process information, and the output layer produces the final result.
3. **Weights:** Parameters associated with connections between neurons, adjusted during training to optimize the network's performance.
4. **Activation Function:** Introduces non-linearity to the model, enabling it to learn complex patterns.
5. **Training:** Involves presenting input data with known outcomes to the network, adjusting weights to minimize the difference between predicted and actual outcomes.
6. **Backpropagation:** An algorithm used during training to propagate the error backward through the network and adjust weights accordingly.
7. **Deep Learning:** ANNs with multiple hidden layers are referred to as deep neural networks, and the field focused on them is known as deep learning.

ANNs are versatile and can be applied to various tasks, including image and speech recognition, natural language processing, and regression problems. They have been highly successful in solving complex problems and are a fundamental component of modern machine learning and artificial intelligence applications.