

Understanding arises from reducing one type of reality into another

Modelling is the art of making appropriate (simplifying) assumptions; it is the art of finding suitable abstractions. For example, take this model/representation of a bird:



Someone might argue that birds are characterised by feathers, or their flight, giving ideas on how to improve the model.

The following picture suggest a seemingly “better” model of a lapwing):



In projects we argue whether to use a Boolean rules, ODEs, or PDEs; discuss which variables need to be modelled etc.

With the model of the bird, its purpose is to identify this species. It turns out that the following model is just right to unambiguously identify a male lapwing across Europe:



As they say: “all models are wrong but some are useful”.

The purpose of abstraction is thus to find a semantic framework in which one can be very precise, without considering every detail of a complex system.

We are thus seeking simplicity in the representation but thereby also reveal simplicity in complexity - with the ultimate goal to discover law-like principles.

**Mathematics is an art that makes us realize reality.
A model is a lie that makes us realize truth.**