I would like to avail myself to very simple but illuminating examples, and highlight their similarities, despite the difference in mathematical context:

1. The real line, with the usual addition, and multiplication by a real constant.

2. The 2-dimensional Cartesian plane, with the usual vector addition, and multiplication by a real number.

3. Increase the dimension $n$, and talk about $\mathbb{R}^n$.

4. Let $A$ be a given set. Consider the power set of $A$ and the field $\mathbb{Z}_2 := \{0, 1\}$, with vector addition as disjoint union, and scalar multiplication defined by the two equations (1) $1 \cdot X := X$ and (2) $0 \cdot X := \emptyset$ for all subsets $X$ of $A$. Then $(\mathcal{P}(A), \dot{\cup}, \cdot)$ forms a vector space.

The similarities to be highlighted include the (carrier) set $V$ which is the vector space, the vector addition, and the scalar multiplication.

Then comes the set of axioms to be satisfied.