Let $R$ be a commutative, Noetherian, local ring. We consider the semigroup of isomorphism classes of finitely generated $R$-modules, with the semigroup operation induced by the direct sum. This approach yields some “nice” properties that hold for all decompositions. For example, one cannot have indecomposable modules $A$ and $B$ such that $A \oplus A \oplus A \cong B \oplus B$. It also allows one to construct many “silly” examples. For instance, one can have four pairwise non-isomorphic indecomposable $R$-modules $A, B, C, D$ such that $A \oplus B \oplus C \cong D^{(217)}$ (the direct sum of 217 copies of $C$).

In this talk I will describe how one obtains such silly examples and also consider the following question: Given a module $M$ and a positive integer $n$, how many indecomposable modules occur as direct summands of $M^{(n)}$? This will lead to some open problems that are accessible to advanced undergraduates. (Received September 15, 2018)