Rna def

RNA is made up of strands of four different bases that encode genomic information in specific ways. The bases are elements of the set $B = \{\mathtt{A}, \mathtt{C}, \mathtt{U}, \mathtt{G}\}$.

Formally, to define the set of all RNA strands, we need more than roster method or set builder descriptions.

New! Recursive Definitions of Sets: The set S (pick a name) is defined by:

Basis Step:	Specify finitely many elements of S
Recursive Step:	Give rule(s) for creating a new element of S from known values existing in S, and potentially other values.

The set S then consists of all and only elements that are put in S by finitely many (a nonnegative integer number) of applications of the recursive step after the basis step.

Definition The set of nonnegative integers $\mathbb{N}$ is defined (recursively) by:

Basis Step:
Recursive Step:

Examples:

Definition The set of all integers $\mathbb{Z}$ is defined (recursively) by:

Basis Step:
Recursive Step:

Examples:

Definition The set of RNA strands S is defined (recursively) by:

Basis Step:	$\mathtt{A} \in S, \mathtt{C} \in S, \mathtt{U} \in S, \mathtt{G} \in S$
Recursive Step:	If $s \in S$ and $b \in B$, then $sb \in S$

where sb is string concatenation.

Examples:

Definition The set of bitstrings (strings of 0s and 1s) is defined (recursively) by:

Basis Step:
Recursive Step:

Notation: We call the set of bitstrings $\{0, 1\}^*$.

Examples: