

# Water ON

Translate only the  
hydrophilic amino acids:

Arginine	Asparagine
Aspartate	Glutamate
Glutamine	Glycine
Lysine	Proline
Serine	Threonine



# Water OFF

Translate only the  
hydrophobic amino acids:

Alanine

Cysteine

Histidine

Isoleucine

Leucine

Methionine

Phenylalanine

Tryptophan

Tyrosine

Valine





5'



5'



Weak



Strong



Keto



Adenine



Guanine



Purine



Thymine



Cytosine



Pyrimidine



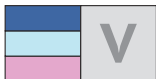
Not A



Not G



Amino



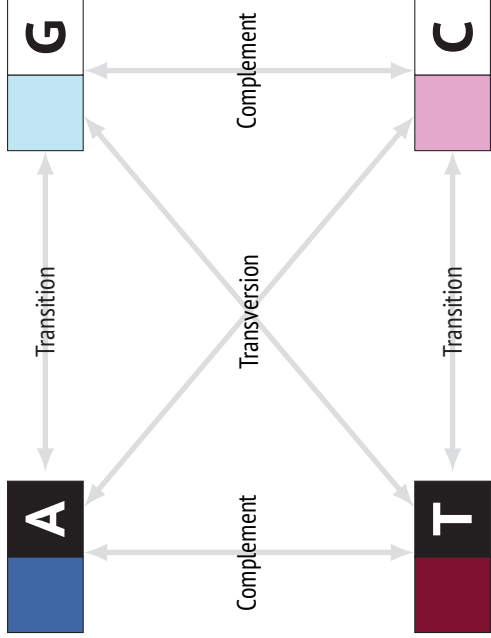
Not T

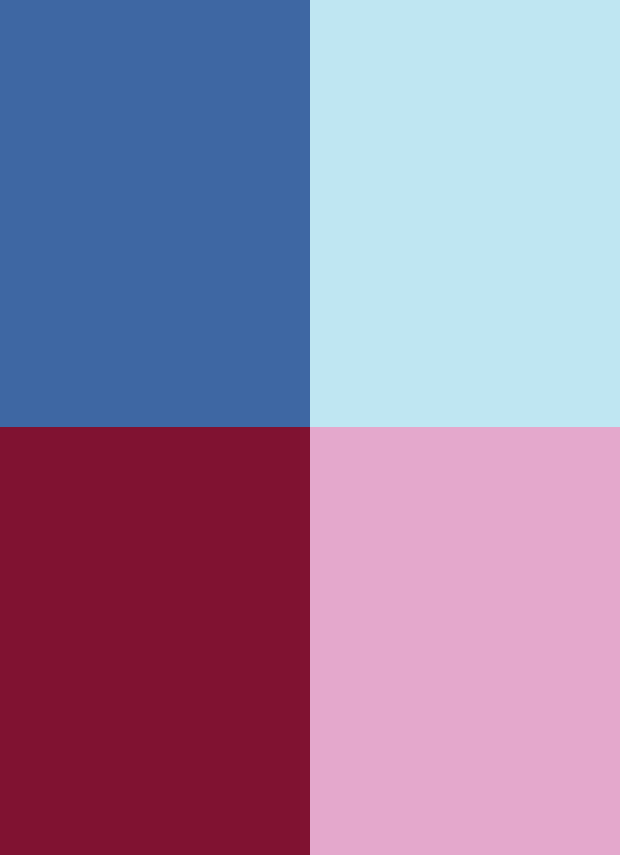


Not C



Any





# Toggle Water ON/OFF

Buy: 0

Use: 1





# Extend

Buy: 0

Use: 1



Roll the die to insert  
a random nucleotide  
at the end of the  
sequence. May  
be used multiple  
times in one round.

# Delete

Buy: 2

Use: 1



Delete any nucleotide  
in the sequence.

# Insert

Buy: 3

Use: 1



Roll the die to  
insert a random  
nucleotide anywhere  
in the sequence.

# Reverse Complement

Buy: 3

Use: 1



Swap the 5' and 3' ends to read the sequence in the opposite direction on the opposite strand.

# Complement

Buy: 3

Use: 2



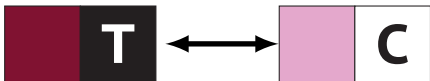
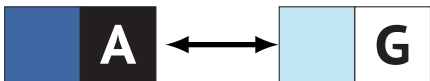
Rotate  
any nucleotide  
180 degrees.



# Transition

Buy: 3

Use: 2



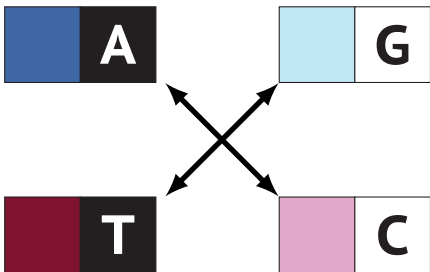
Flip  
any nucleotide  
horizontally.



# Transversion

Buy: 3

Use: 2



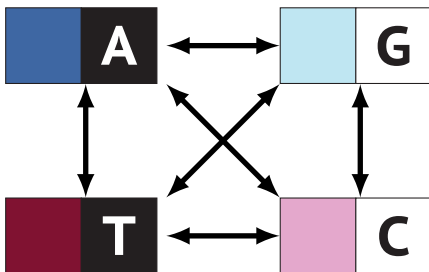
Flip  
any nucleotide  
vertically.



# Mutate

Buy: 5

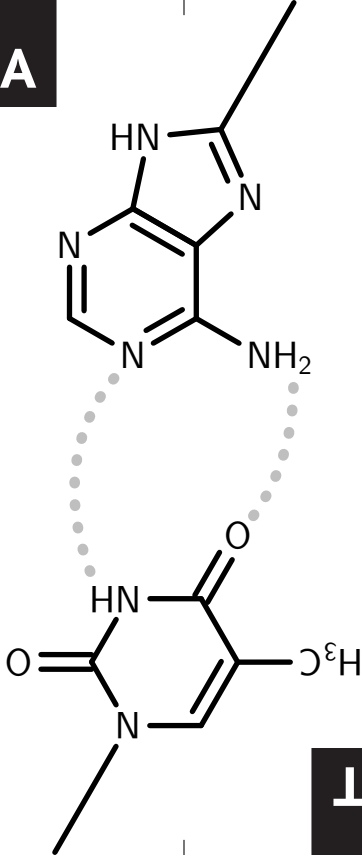
Use: 3



Rotate or Flip  
any nucleotide  
in any direction.

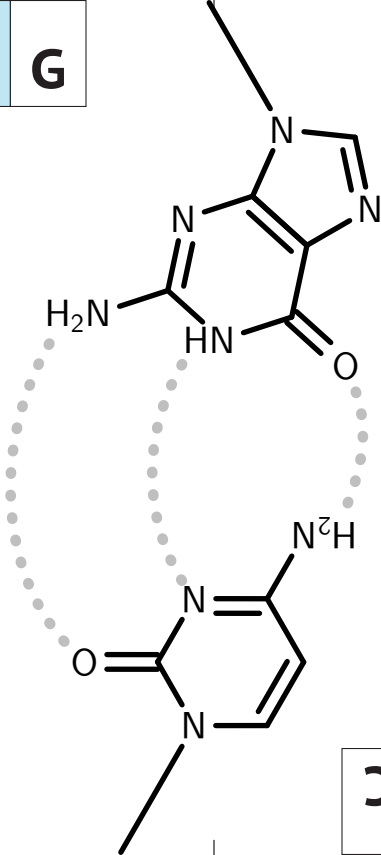


**A**



**T**

**G**



**C**