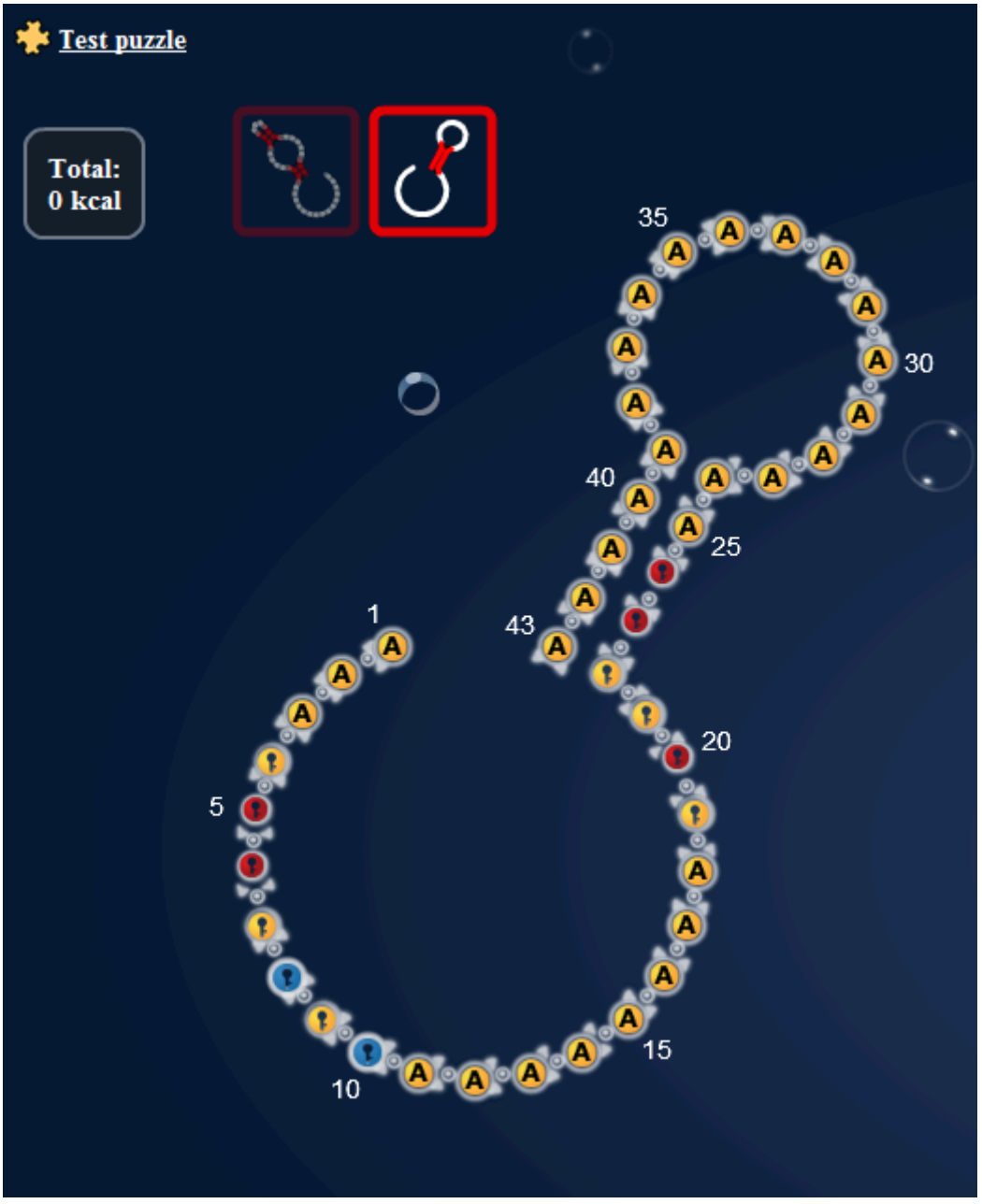
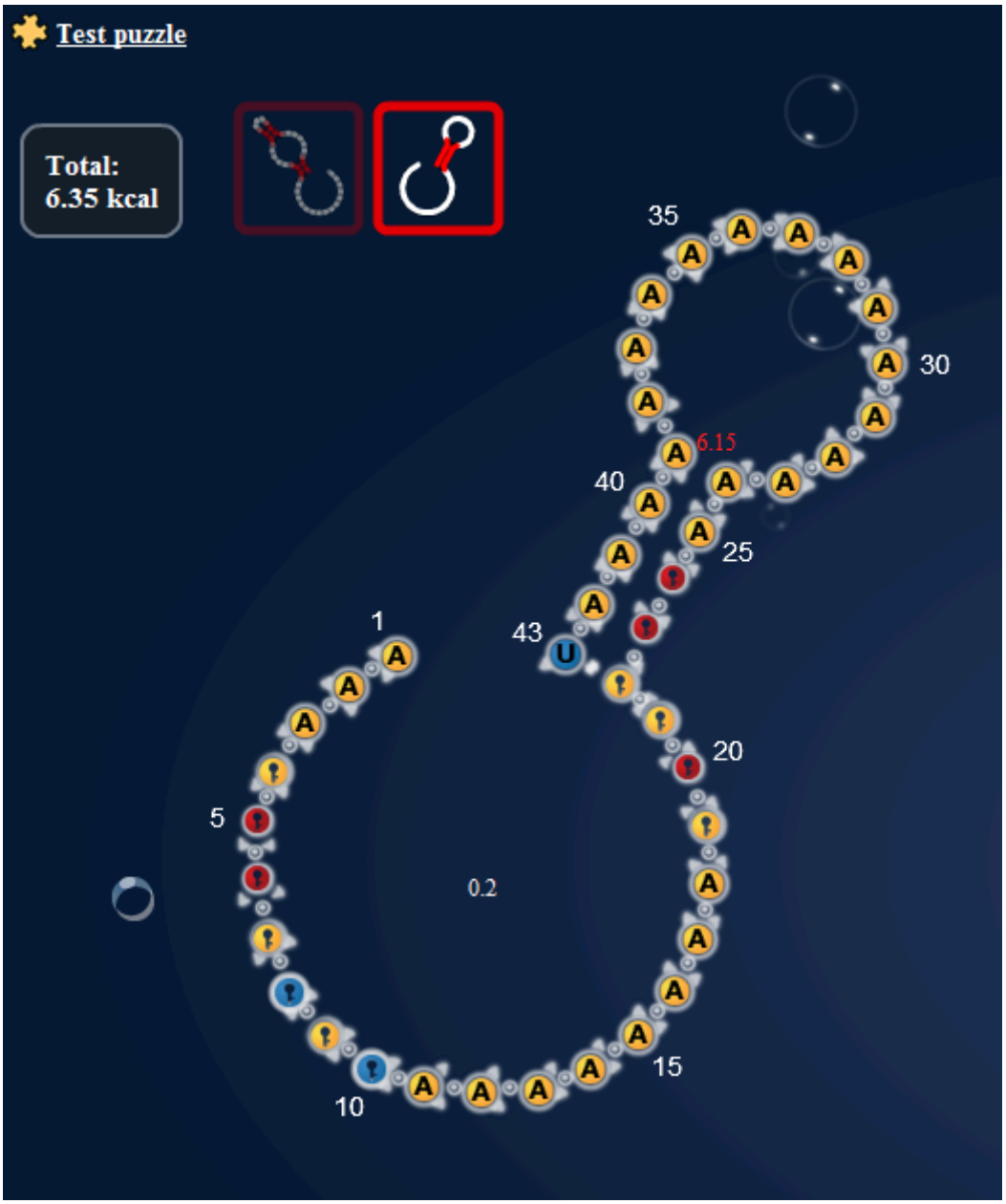
Basic RNA switch walkthrough

This walkthrough is based on the puzzle Basic RNA switch.

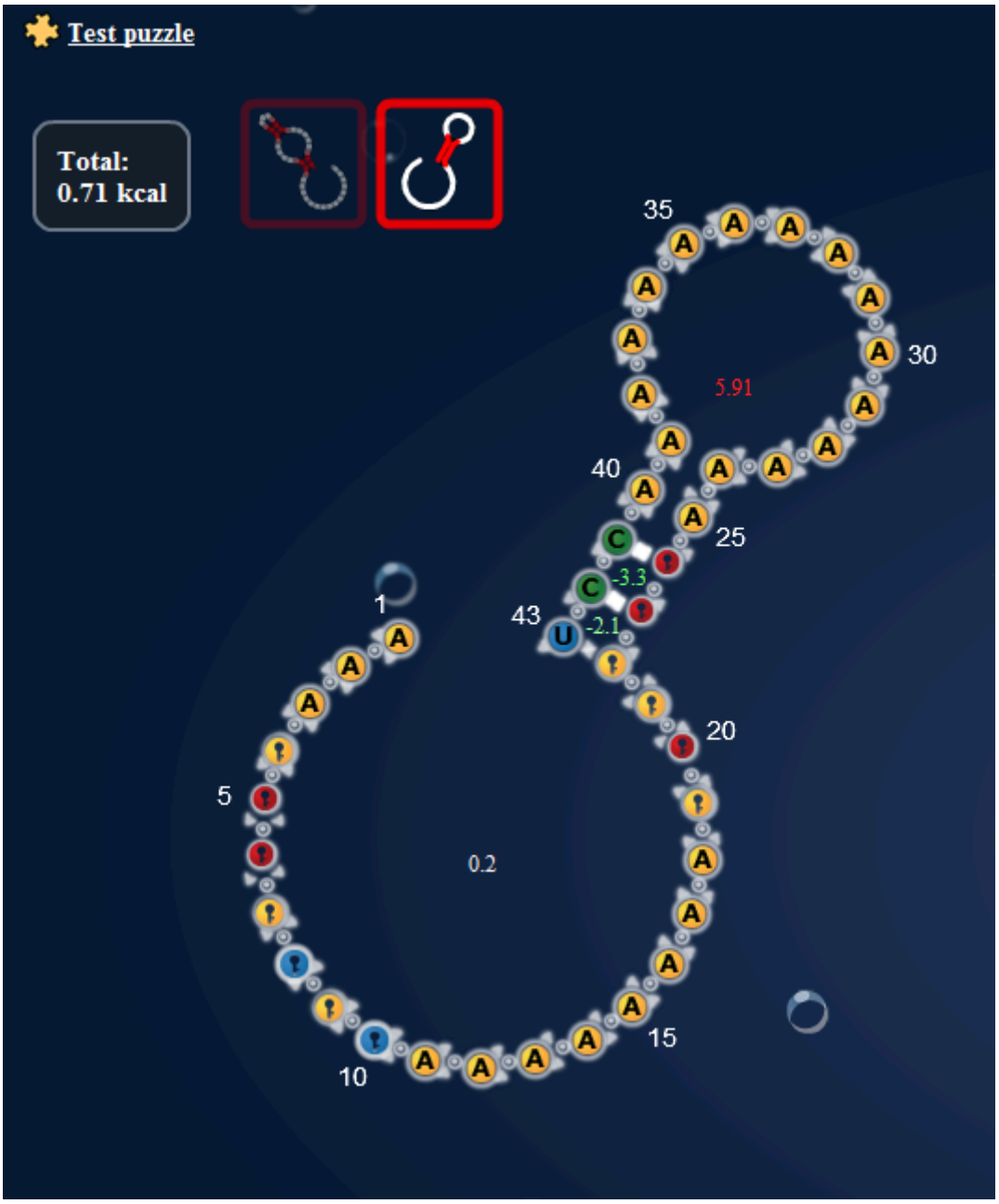
Open the puzzle. It begins in the unbound hairpin shape.



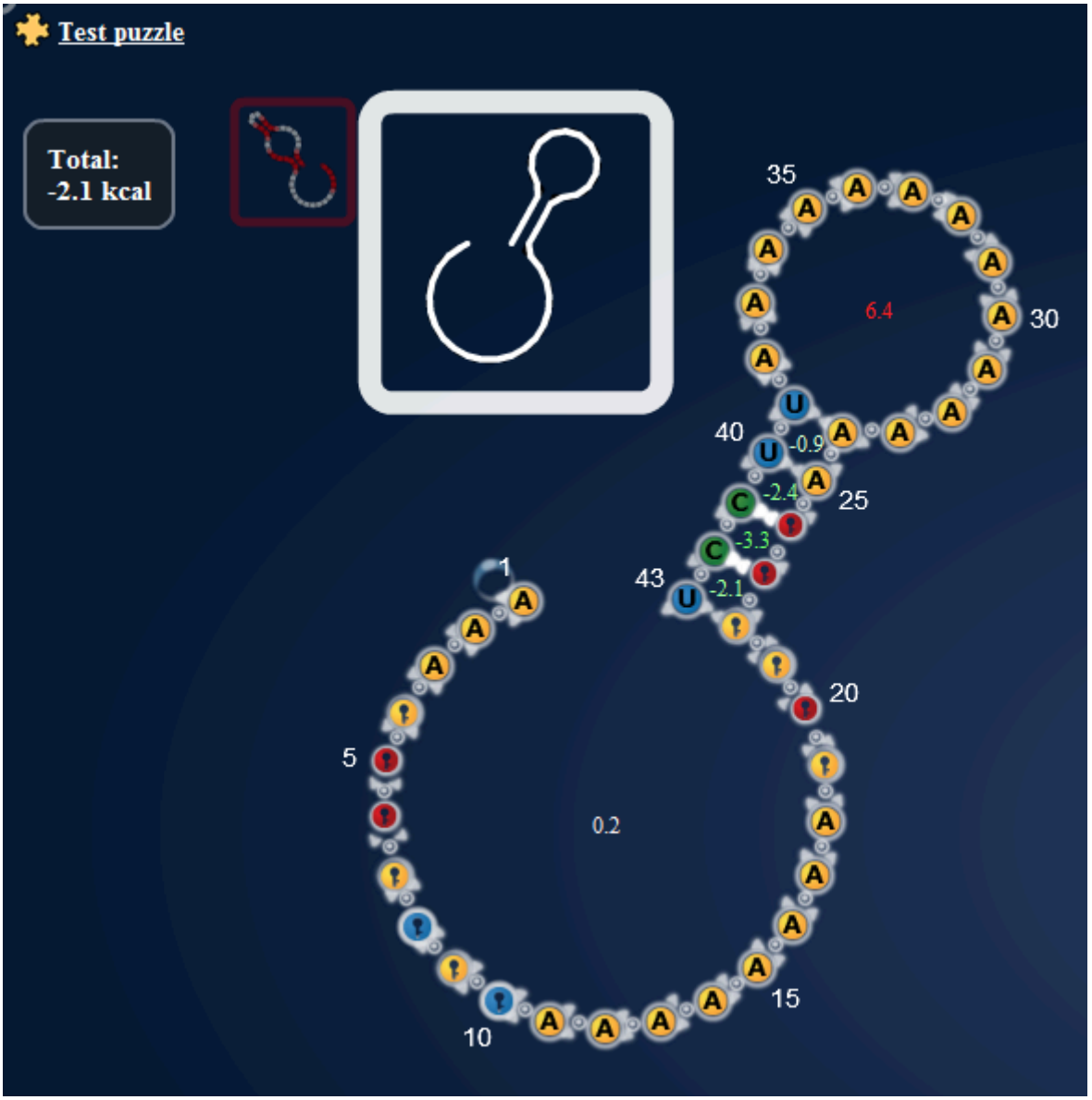
First fill in the partners to the locked nucleotides in the string. Place a blue uracil at 43.



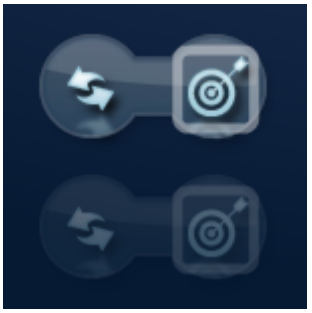
Nucleotide 41 and 42 can be either green C or (blue) U. Start with GC-pairs.



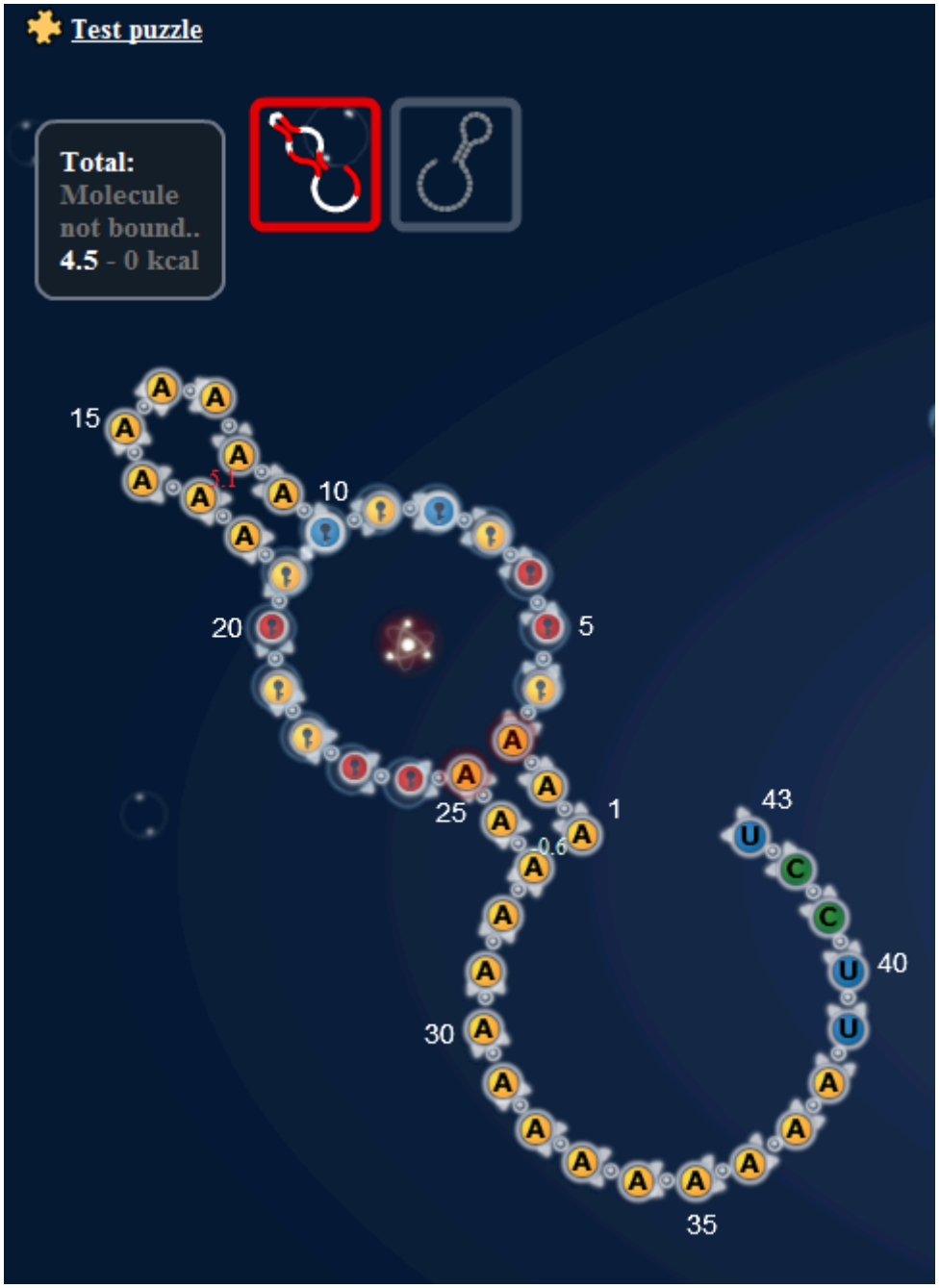
Now the locked bases in the string have partners. Fill out the last of the hairpin stack, so the unbound shape is solved.



Choose the top target box to switch to the Molecule-bound shape, to see if anything you did in the Unbound shape will collide here.

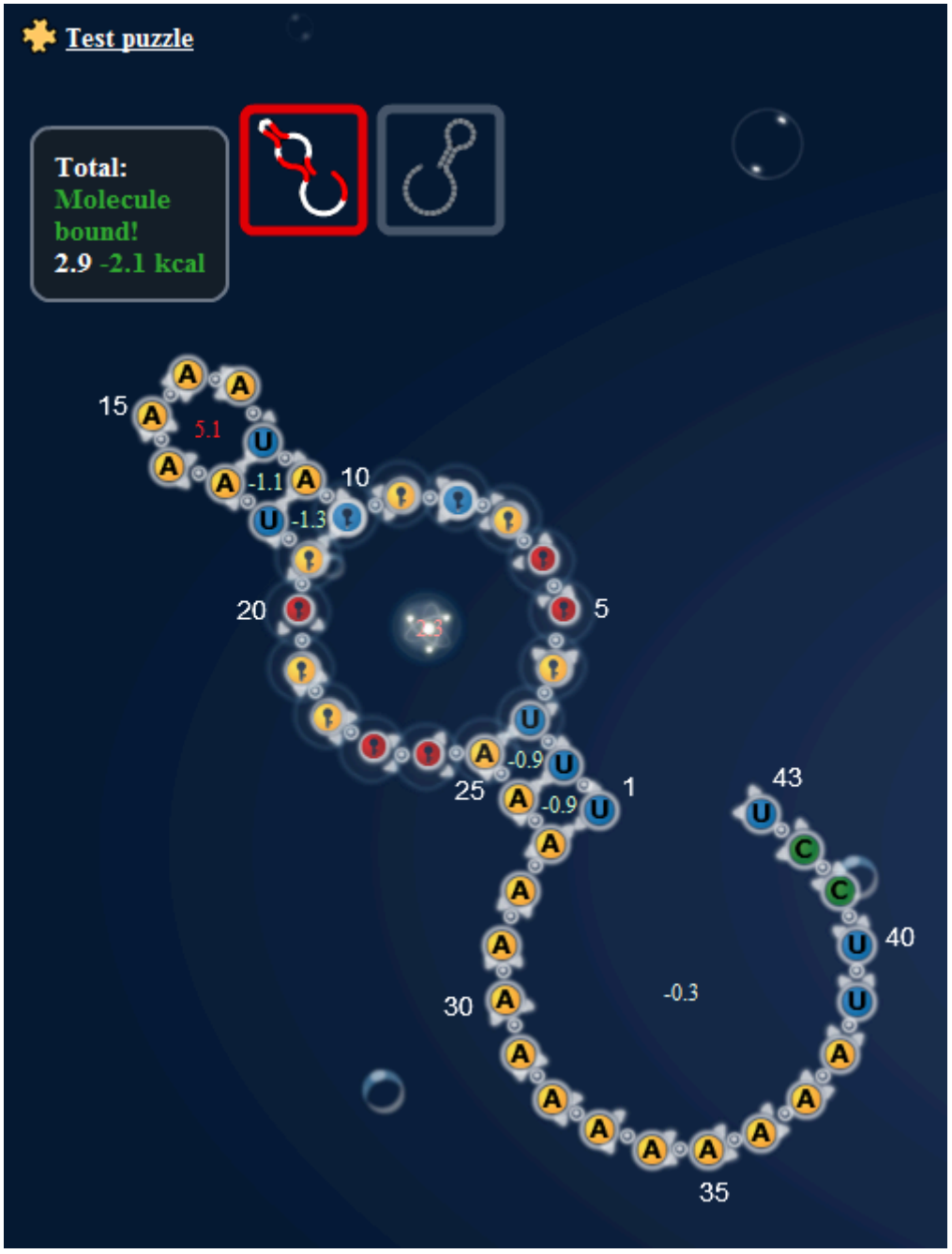


You can see that none of the nucleotides added in the Unbound shape, ends up in illegal places in the Molecule-Bound shape.

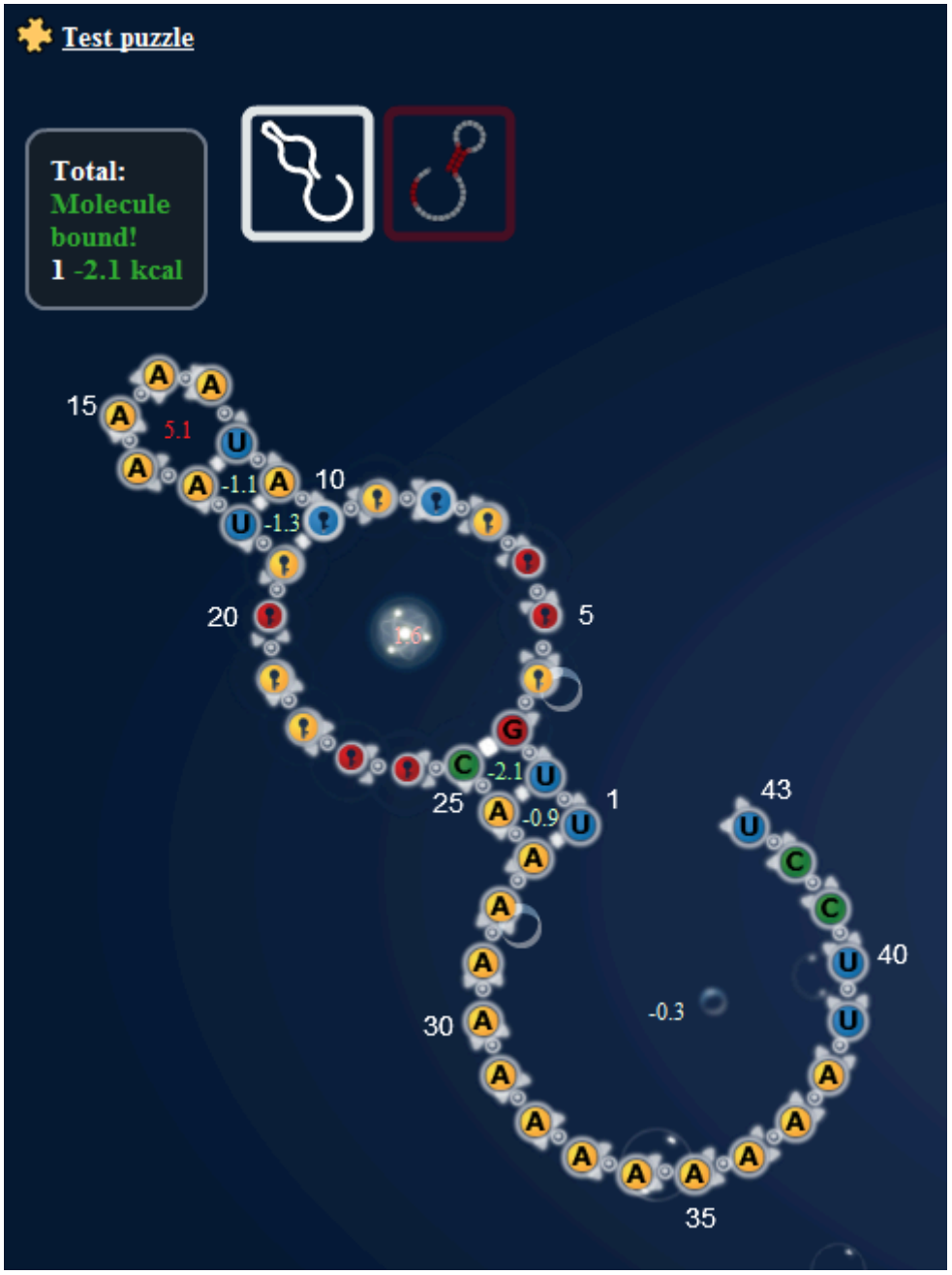


Now start to fill in basepairs, one at a time, while you keep an eye of the Unbound shape, to make sure that it doesn't become unstable.

First fill in AU-pairs in a manner so the Unbound hairpin shape stays stable.

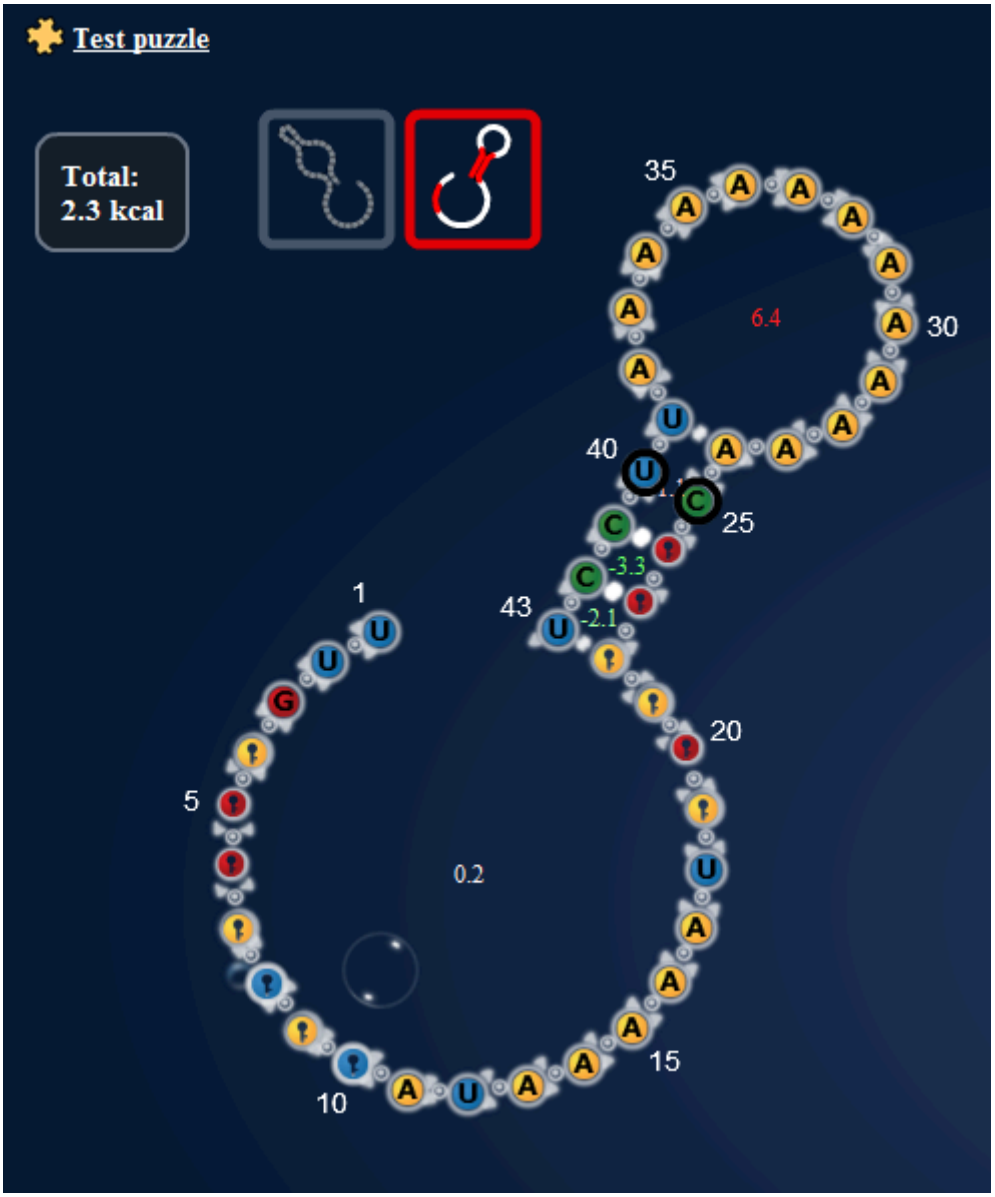


Now try place a GC-pair somewhere.



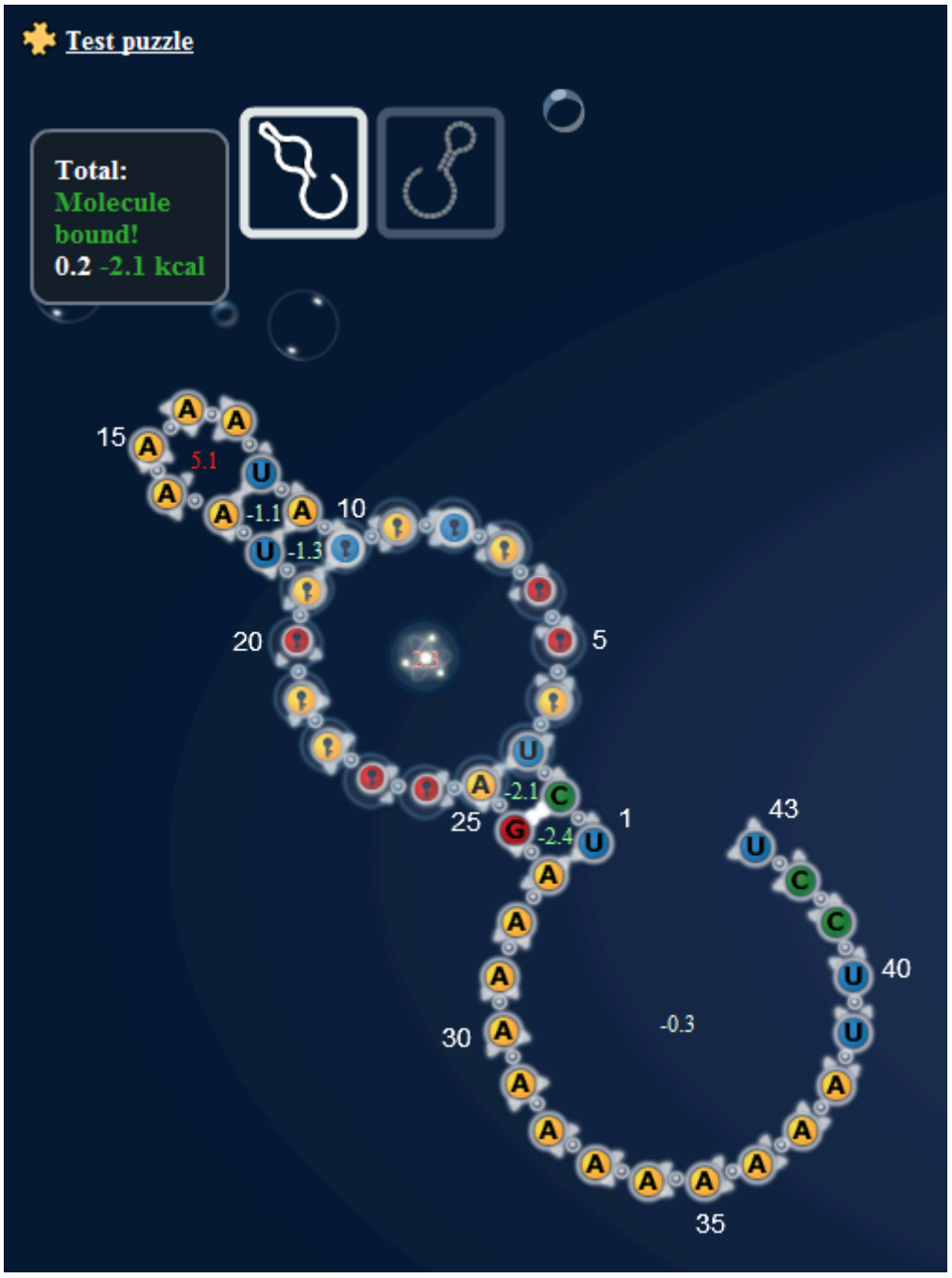
This GC-pair made the unbound hairpin shape unstable, even though it made the Molecule-bound shape. To see why, take a look at it in the Unbound shape.

Here you can see that the green C at position 25 from the Molecule shape, ends up at opposite a blue Uracil at position 25 in the hairpin shape. Have the numbers turned on while you solve, as they can be a help to track where what nucleotides goes. You can also highlight bases by pressing Ctrl and clicking with the mouse on the nucleotide.



So go back to the molecule shape and take out the GC-pair again. You can do that by pressing the key Z, this will undo you putting the GC-pair in.

Put in a GC-pair elsewhere, so both shapes becomes more stable.



And both shapes of the puzzle is solved!

Now it is time for you to give your RNA molecule some personality, if it is a lab puzzle. You can leave your individual mark, by putting in more GC-pairs, maybe some GU's or swap things around. Change the puzzle one nucleotide or basepair at a time.

Have fun!
Thanks to Starry for editing this puzzle walkthrough. Thanks also to Starry and Jee, for input on terminology.