

CadnanoSQ interface (1/4)

Editing tools we will use



Allows you to drag ends of 3' and 5' ends



Breaks an existing strand into two pieces



Deletes the entirety of a strand on a single helix



Populates all existing scaffold strand (blue) with staples. Also adds crossovers where possible.

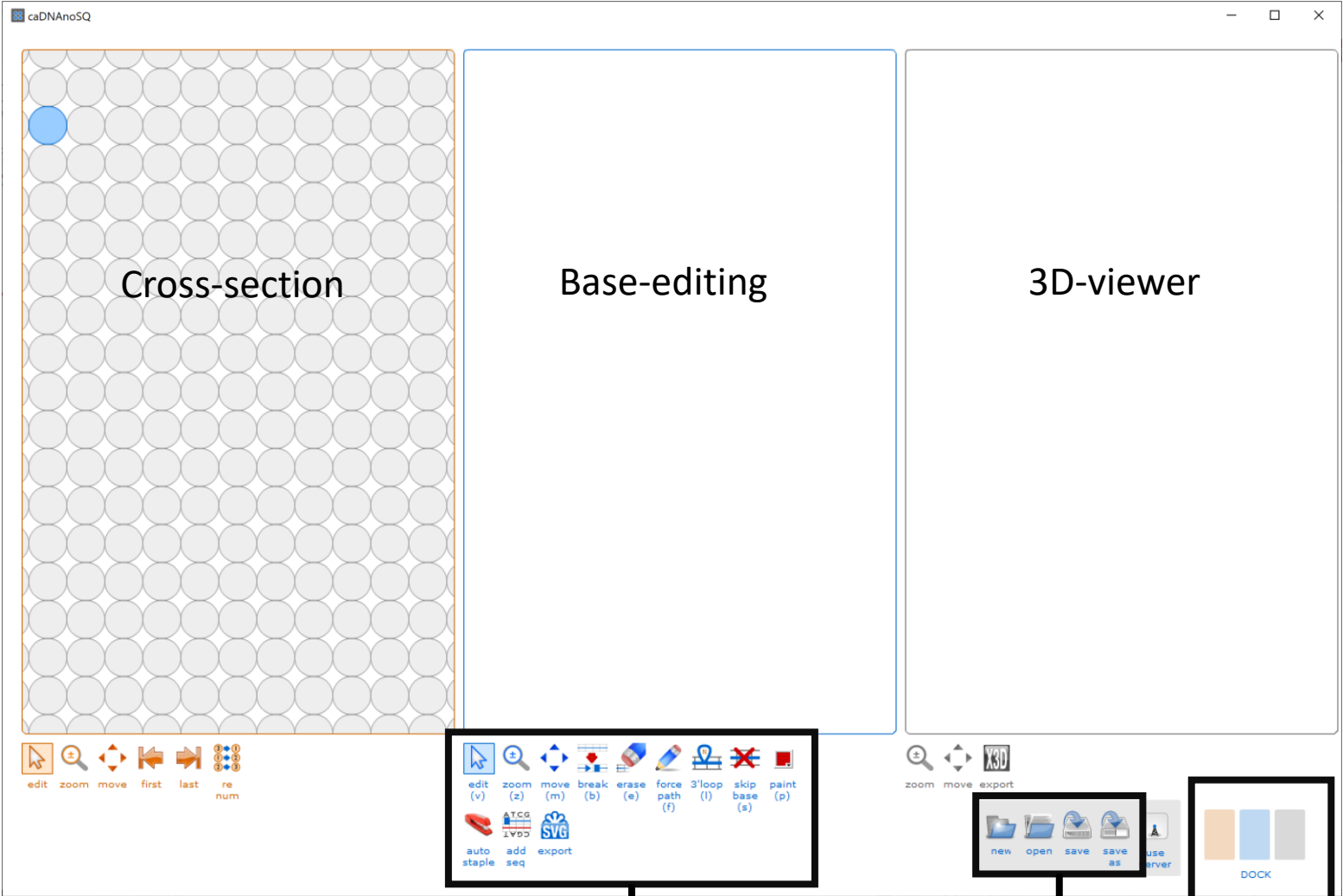


Creates a connection with no length, between two bases (5' to 3'). Allows for things to be spaced out in Cadnano.



Moves you around the “Base-editing” window. Can also do this with the arrow keys.

Beware! In this older version of Cadnano there is no undo feature ☹



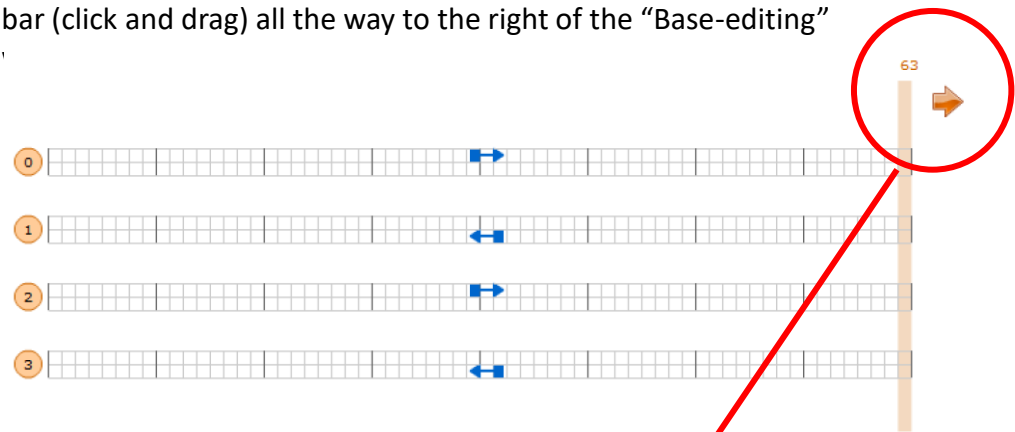
Editing Tools

Save options

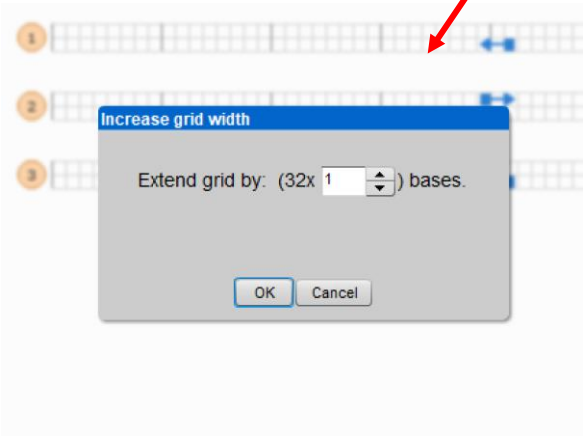
Toggle active regions

Changing working area

To add more bases: with the **Edit (v)** tool selected, move the orange bar (click and drag) all the way to the right of the “Base-editing”

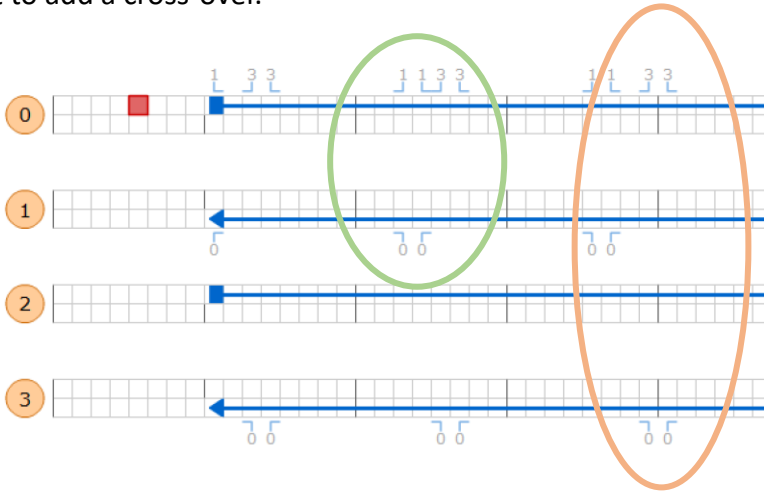


Choose number of bases (the open boxes) to add.

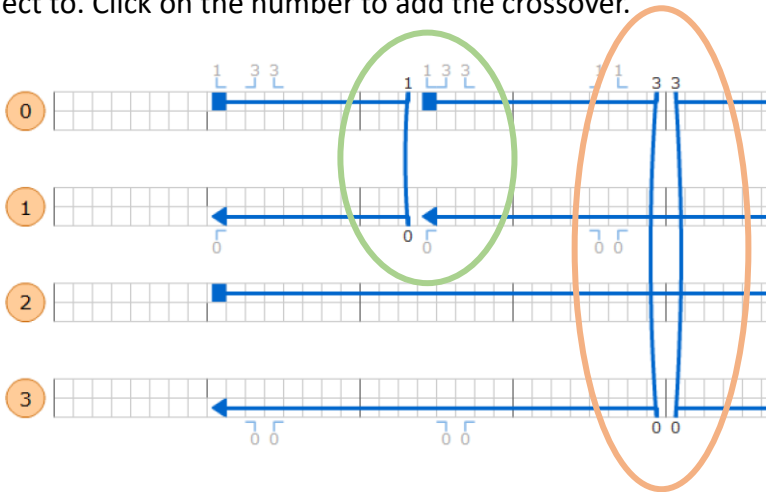


Adding cross-overs

With the **Edit (v)** tool selected, click on a strand around the area you want to add a cross-over.

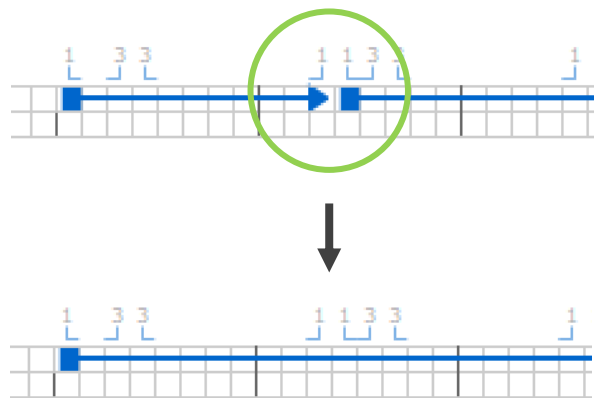


The small numbers with the right angles show where cross-overs can be placed. The number tells you which helix the cross over will connect to. Click on the number to add the crossover.



Closing a break

With the **Edit (v)** tool selected, hold *Shift* and click on either the 3' or 5' end around the break to join the strands together.

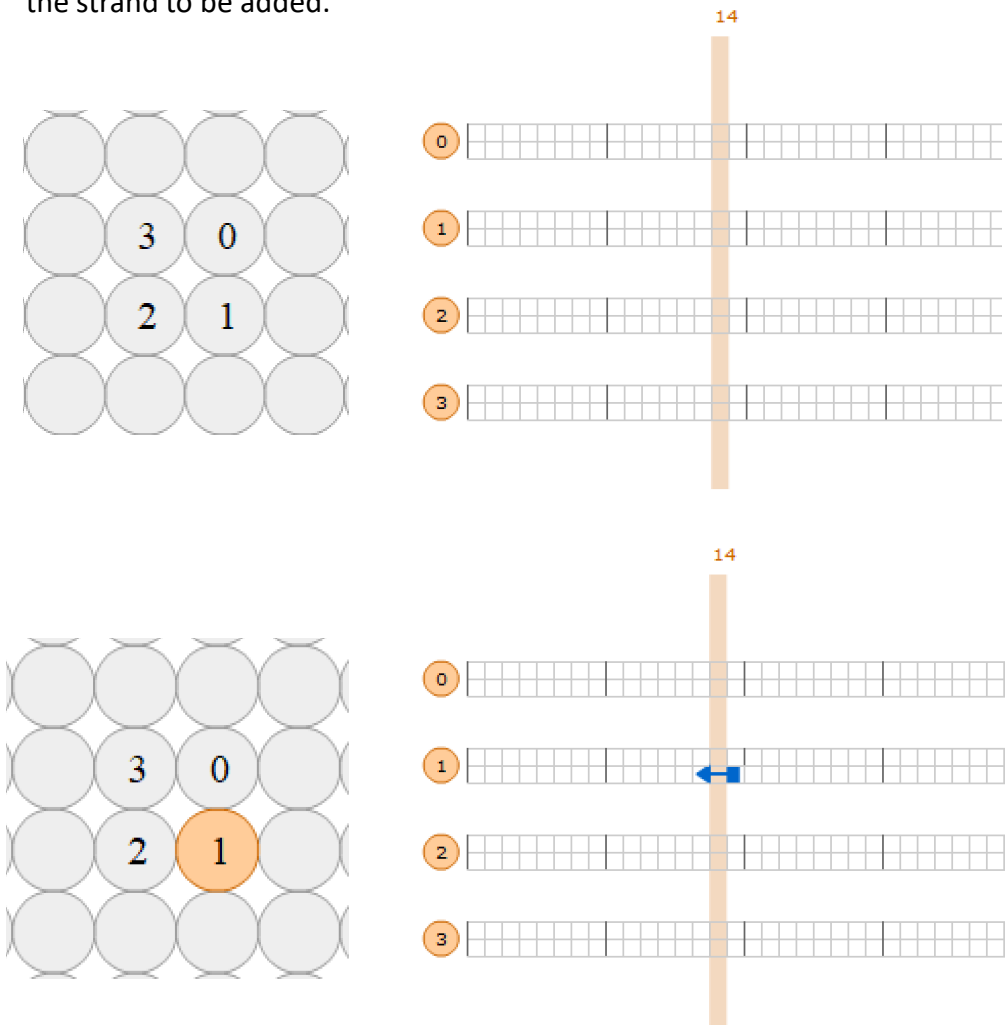


Removing a cross-over

Just double click on the crossover.

Adding a new strand on a helix

Sometimes you want to add strand on an existing helix. With the **Edit(v)** tool selected. Move the orange bar to the location that you want the new strand to appear. In the “Cross Section” window, click on the helix number you want the strand to be added.

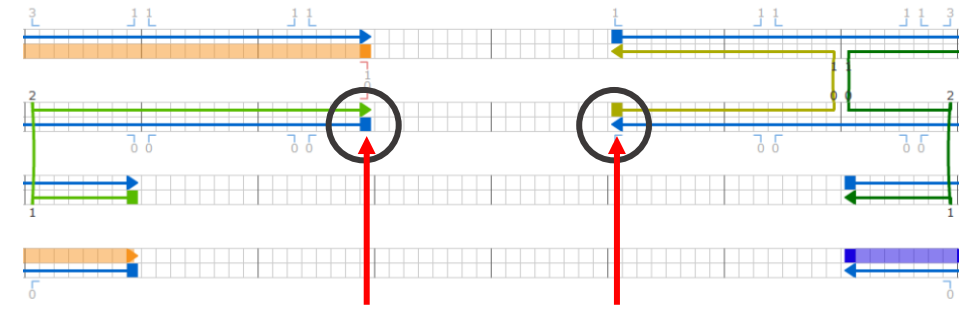


CadnanoSQ interface (4/4)

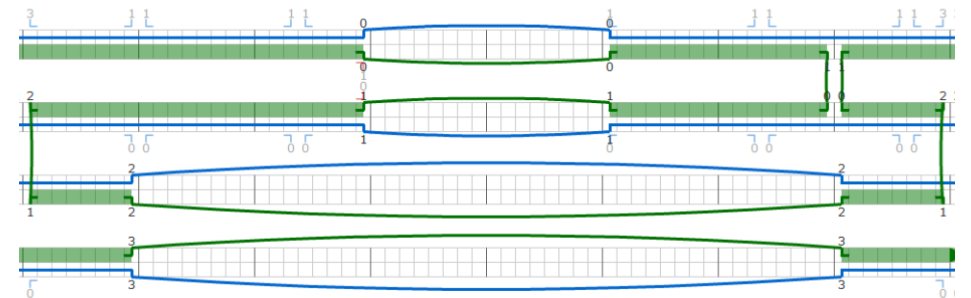
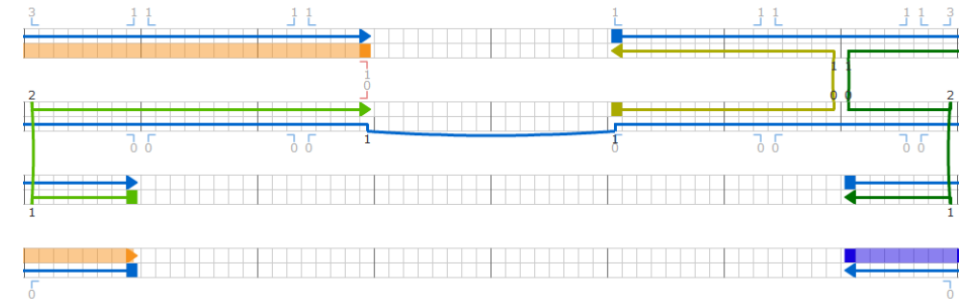
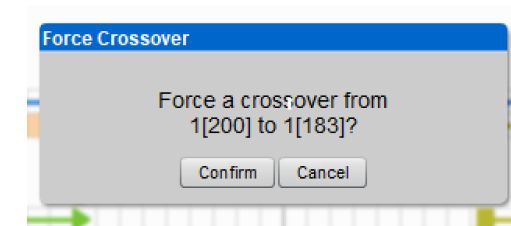
Connecting separate bricks in a structure

Sometimes you want to have your design have disjoint regions in the Cadnano design, like when making a hinge. But the scaffold still needs to route all sections of the structure to be in a single loop. We use the **Force path (f)** tool to add connections across gaps in the design.

1. With the **Force path (f)** tool selected, click on the 3' end (triangle) and then click on the 5' end you want to connect to.
2. Click **Confirm**



Then here Click here



Cadnano2 interface (1/3)



Select

Lets you select bases and move around cross-overs and 3'/5' ends.



Pencil

Allows you to add bases/strands to the design.



Break

Breaks an existing strand into two pieces



In **cadnano2** you can toggle what parts of the strands you can select, for today leave them in this configuration. If things start acting strange, check that they are toggled to the right state.

You can move around either region with the arrows keys and can zoom in/out with the scroll wheel.

Rejoice! This version has undo! Press Command+Z to undo your last actions.

Creates Sq cross-section

Save options

AutoStaple tool

Editing Tools

cadnano

File Edit Plugins

New Open Save SVG Export Honeycomb Square AutoStaple Selectable SCAF STAP

First Last Rnum

Cross-section

Base-editing

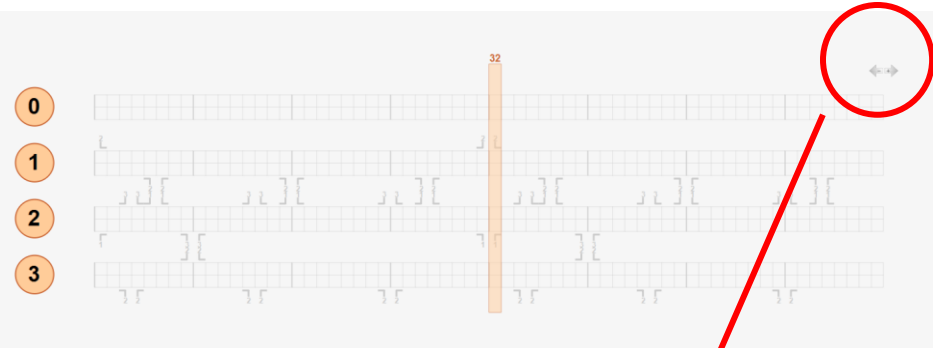
Select Pencil Break Insert Skip Paint AC 19 Seq

Defines selection type

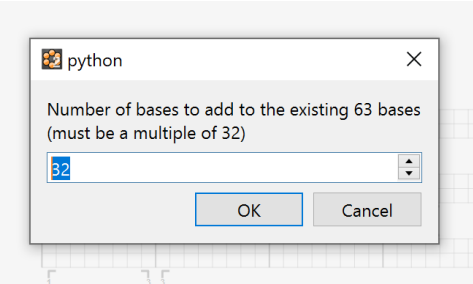
Cadnano2 interface (2/3)

Changing working area

To add more bases: at the right side of the “base-editing” region, there will be small arrows. Click on the arrow.

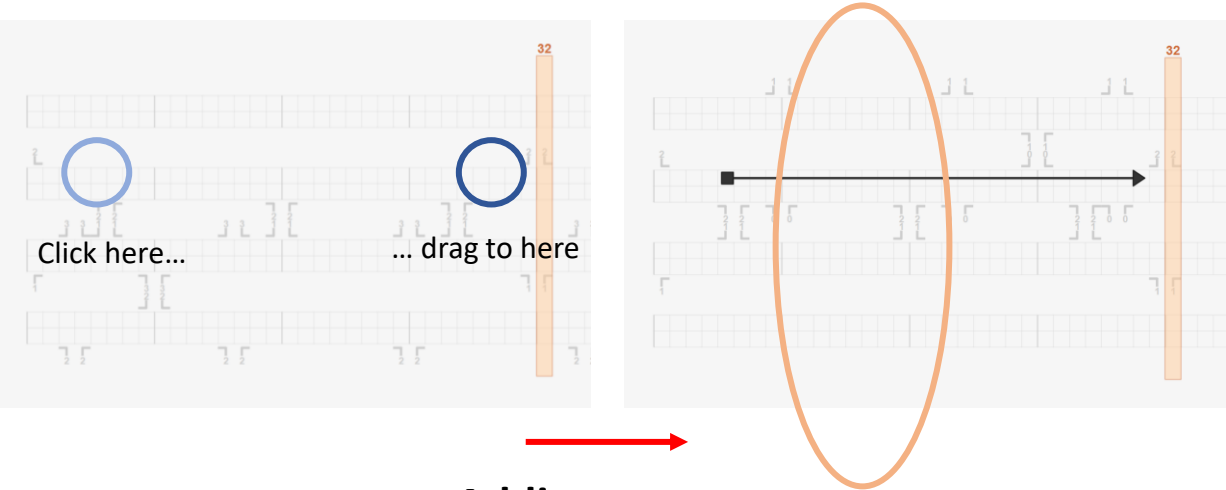


Choose number of bases (the open boxes) to add.



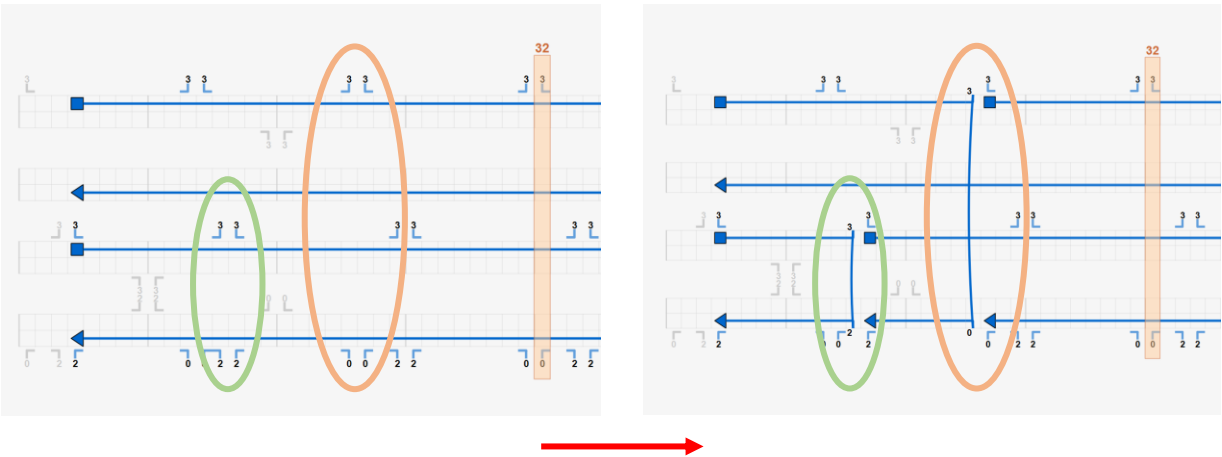
Adding a new strand on a helix

Sometimes you want to add strand on an existing helix. Using the **Pencil** tool, click and drag along any helix to draw on a new strand.



Adding cross-overs

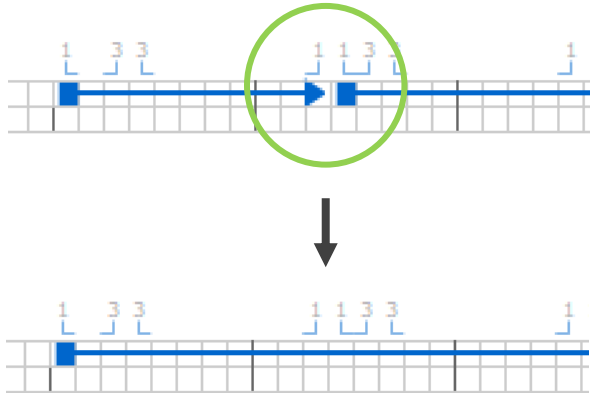
With the **Select** tool, click on the strand you want to add a cross-over. The small numbers with the right angles show where cross-overs can be placed. The number tells you which helix the cross over will connect to. Click on the number to add the crossover.



Cadnano2 interface (3/3)

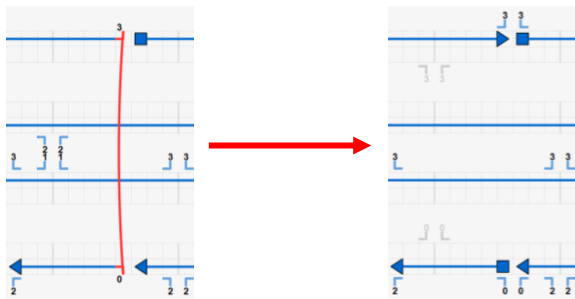
Closing a break

With the **Select (v)** tool selected, hold *Shift* and click on either the 3' or 5' end around the break to join the strands together.



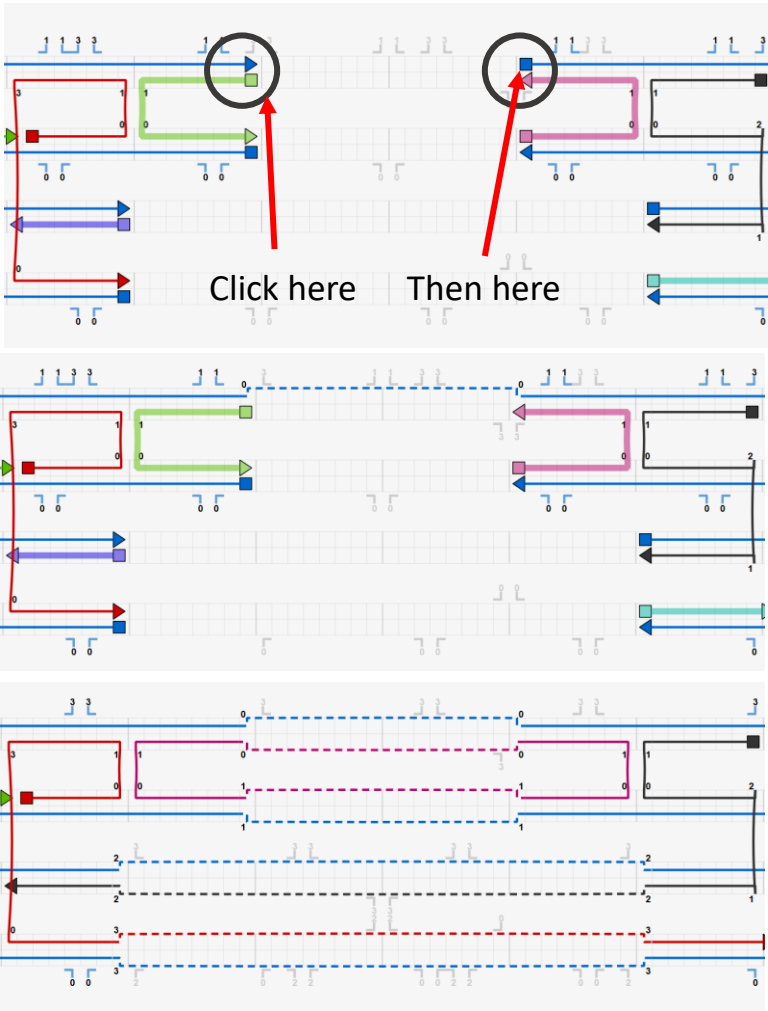
Removing a cross-over

Using the **Select** tool, click on the cross-over, it will turn red. Press the Delete or Backspace key to remove the selected cross-over.



Connecting separate bricks in a structure

Sometimes you want to have your design have disjoint regions in the Cadnano design, like when making a hinge. But the scaffold still needs to route all sections of the structure to be in a single loop. We use the **Pencil** tool to add connections across gaps in the design. Click on a loose 3' end (arrow) and then on any 5' end (square).



Repeat as desired

Steps to making a structure

1. Choose a cross-section of helices for the object.
2. Create loops of scaffold for pairs of helices.
3. Connect the scaffold helices together to make a single loop
4. Click the **Auto-staple** tool to populate the structure with staples.
5. Break staples!

Staple breaking rules for today

1. No loops. All staples must have a break in them.
2. Keep the length between 24-48 bases long. This is 3 to 6 “blocks”. A block is a region of 8 bases, demarcated by the darker lines in the software.
3. Staples should have one “long” domain. A “long” is a staple region that binds two or more continuous blocks of scaffold on a single helix.
4. No “long – short – long” motifs. A “short” is a staple region that only binds a single block of scaffold on a single helix.
5. No staple segments smaller than 8 bases (one block).

Useful numbers

