DNA Origami Directions and Template

Mountain Fold - A fold downward that forms the shape of an upside-down "V"

Valley Fold - A fold upwards that form the shape of a "V"

Preparation
1. Print out a copy of the origami DNA helix template on regular printer paper. The next page contains a black and white version of the template; you need to color the A,T,C,& G's the proper color that they should fluoresce at.
2. Using your scissors, cut off the blank trim along the outside of the rectangles.
3. Orient the rectangles so that "Front" and "Back" are at the top of the page.
4. Fold the rectangles length-wise down the center line.
   a. "Front" should be at the top of one side and "Back" should be at the top of the reverse side.

Halfing to Sixteenths
1. Orient the paper so that "Front" is at the top of the paper and facing up.
2. Use a valley fold to fold the paper in half along the middle line.
3. Open the fold you just made.
4. Use a valley fold to fold and open the paper at each horizontal solid line.
   You should have 16 small folded sections once you complete this step.
   The paper will have a natural "C" curve to it.

Creating the Backbones
1. Orient the paper so that "Front" is at the top and facing up.
2. Use a valley fold to fold the paper along the left side, following the solid vertical line.
3. Turn the paper over so that "Back" is at the top and facing up.
4. Use a valley fold to fold the paper along the left side, following the solid vertical line.

Making the Spiral
1. Turn paper over so that "Front" is at the top and facing up.
2. Lightly flatten the paper.
3. Use a mountain fold to fold the paper along the diagonal dotted lines.
   You will have 16 diagonal folds.
   The paper will start to curl up.
4. Lightly flatten the paper.
5. Refold the backbone folds along the edges.

Springing to Life: The DNA Helix
1. Hold one end of the paper with one hand, the other end with the other hand.
2. Slowly twist the helix into a loose spiral.
   Once the helix starts to take shape, you do not need to hold both ends of the paper.
3. Starting at the bottom of the helix, loosely gather all of the mountain folds to the center.
   You will be compressing the helix.
   Be careful not to crush the backbones.
4. Release the paper and allow it to spring into shape.
   Depending on how tight you want the helix, you may need to push the helix inwards or pull outwards from the ends.
   You may need to reshape or pull out the backbone after releasing the helix.

FRONT | BACK

A   T   T   A
A   T   T   A
G   C   C   G
A   T   T   A
C   G   G   C
T   A   A   T
G   C   C   G
A   T   T   A
C   G   G   C
T   A   A   T
G   C   C   G
A   T   T   A
C   G   G   C
T   A   A   T
G   C   C   G
G   C   C   G
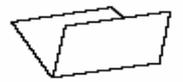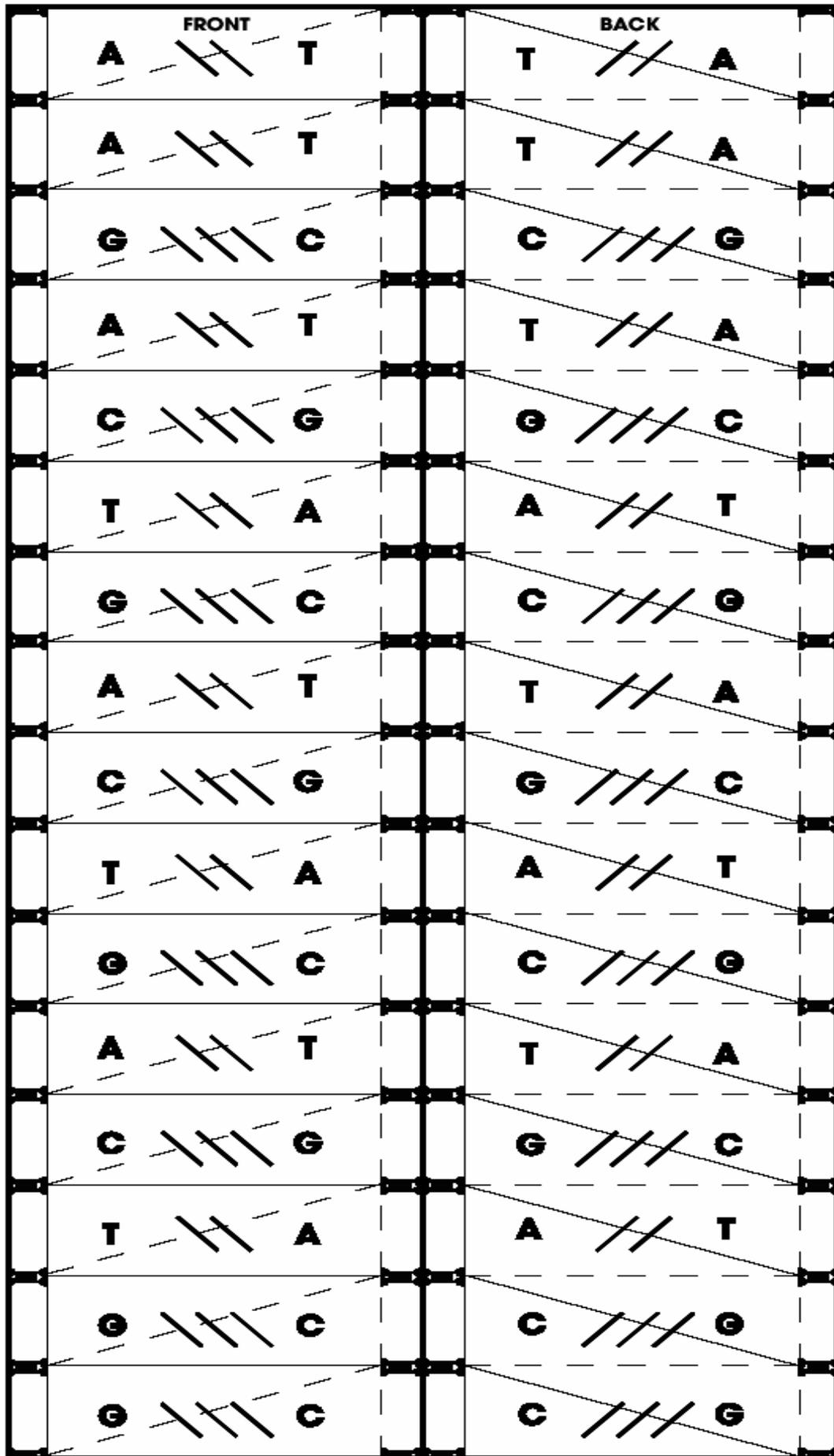
Valley Fold

Mountain Fold