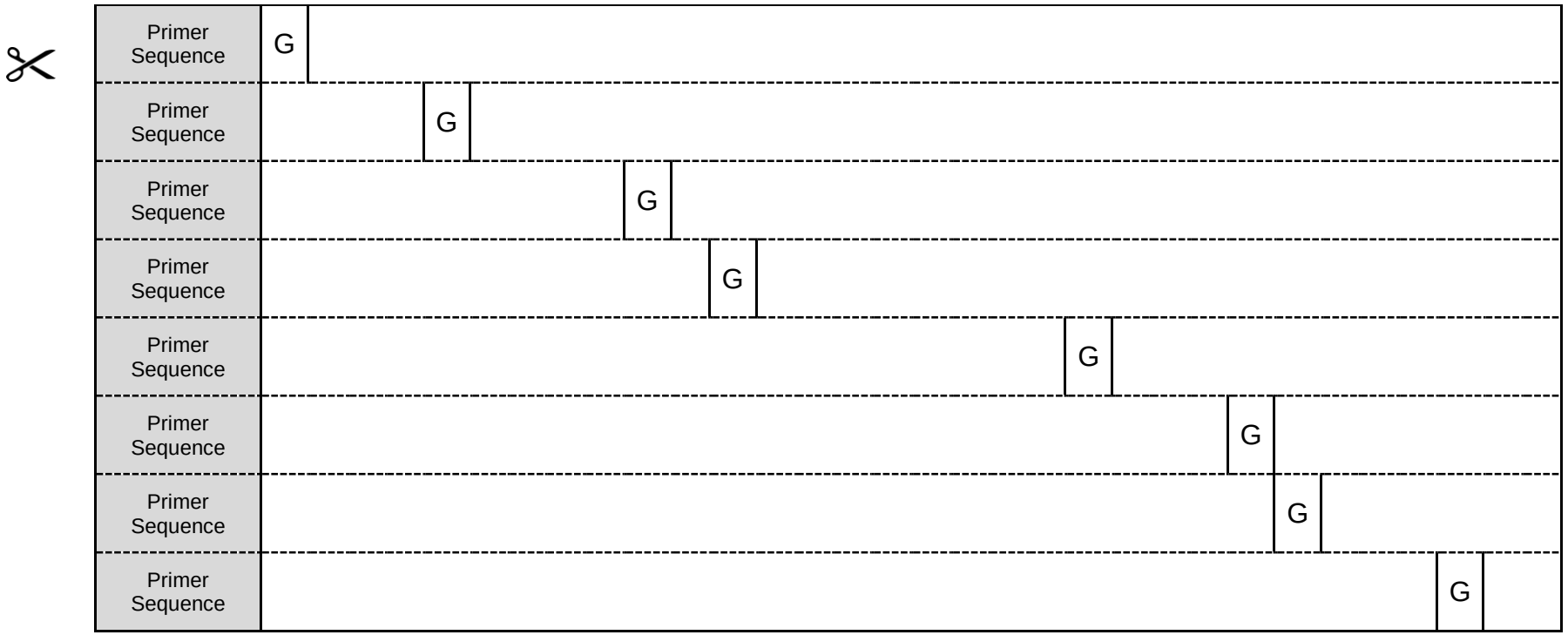
DNA Sequencing – G (Guanine)

Instructions:

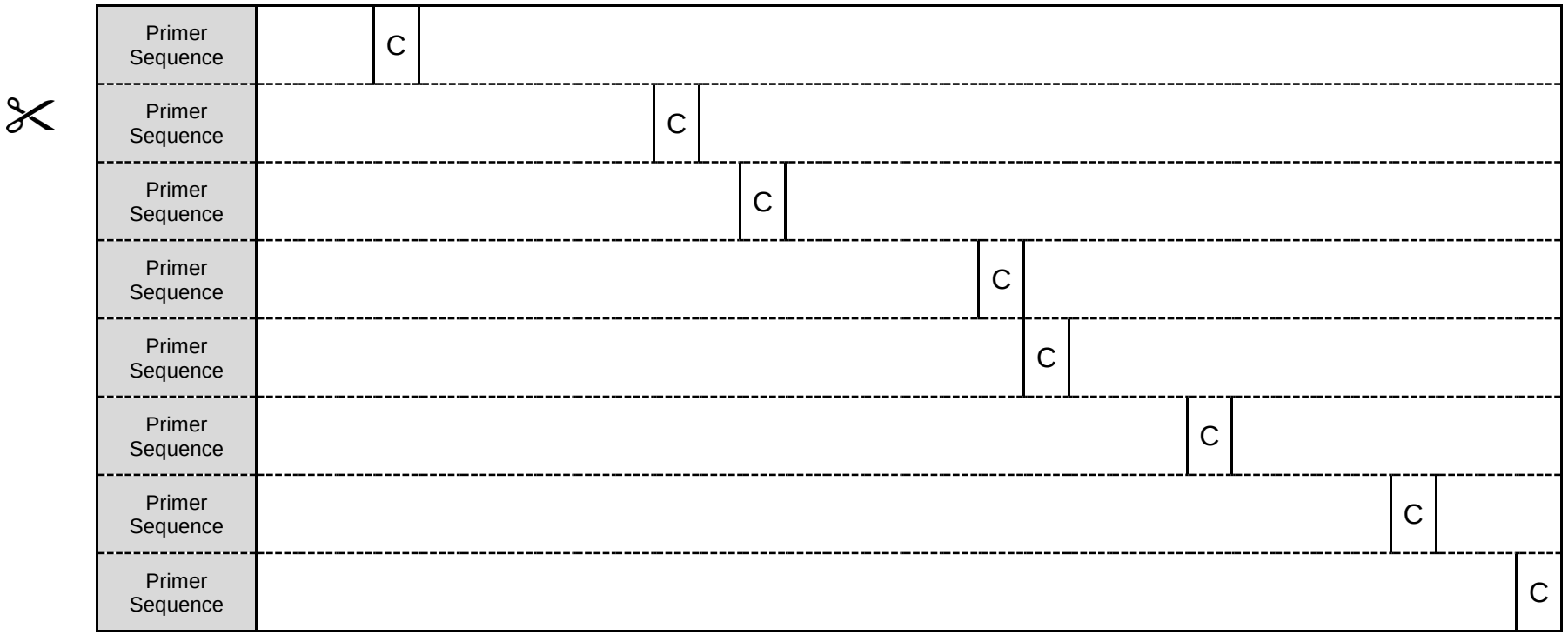
1. Colour in the boxes below for your letter in **GREEN**. This colouring represents a fluorescent dye-labelled ***dideoxynucleotide (ddNTP)*** which has been incorporated into the DNA strand as the strand is replicated through ***Polymerase Chain Reaction*** (PCR). As the DNA strand is replicated many times, each of the bases in a DNA strand can be identified.
2. Next, **carefully** cut around the outside of the chart, and then cut out each row along the dotted lines. You should have **8** strips of paper. These strips represent the copies of DNA strands of different lengths present in the reaction mixture.
3. For each strip, cut the paper to the **right** of the letter which has been coloured in. This is to model the termination of strand extension as a result of the addition of a ddNTP. The ddNTP stops strand extension because its molecular structure does not allow another nucleotide to attach next to it. The ddNTP, therefore, identifies the base at the position where the strand extension stopped.
4. Stack your strips with the longest at the bottom and the shortest at the top, then staple the stack together at the end marked **primer sequence**. Make sure that the primer sequence end is **lined up carefully!** This models the arrangement of fluorescent nucleotides as they would appear after gel electrophoresis.
5. Follow the rest of the instruction on the **DNA Sequencing – Group Consolidation** sheet.



DNA Sequencing – C (Cytosine)

Instructions:

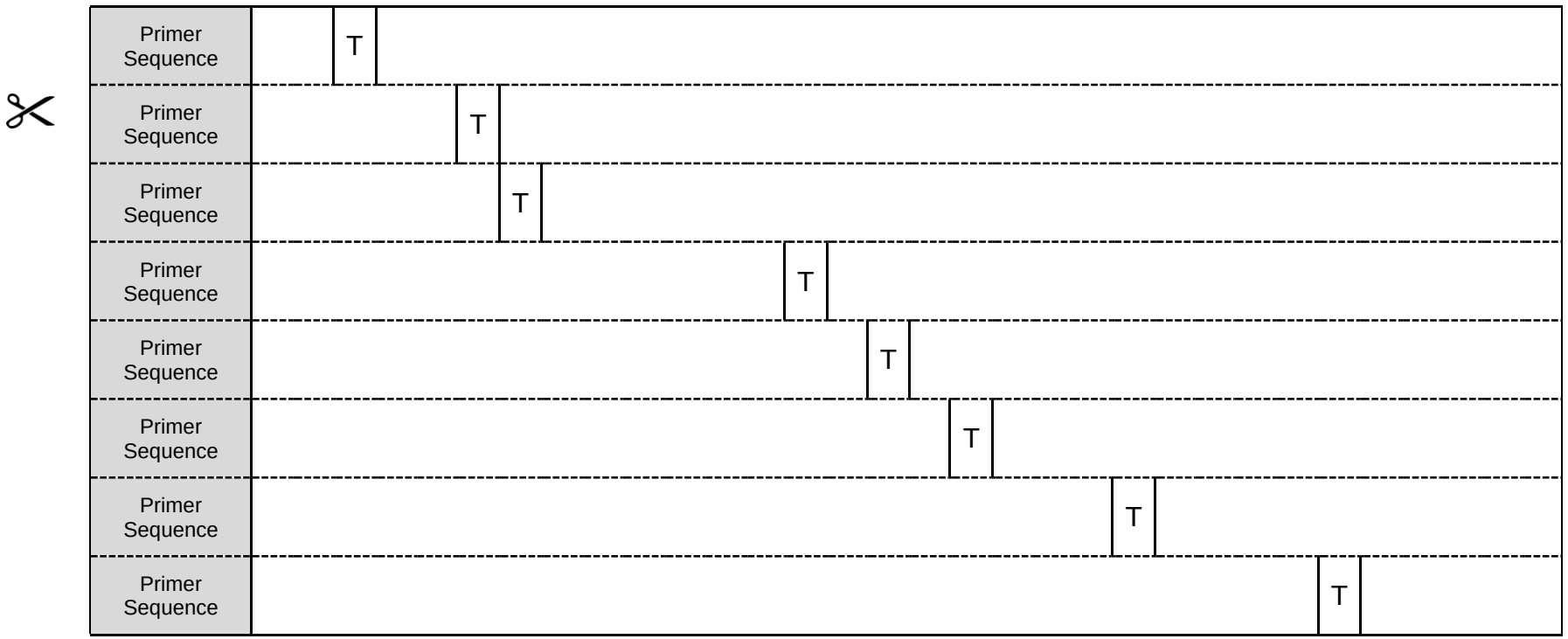
1. Colour in the boxes below for your letter in **YELLOW**. This colouring represents a fluorescent dye-labelled ***dideoxynucleotide (ddNTP)*** which has been incorporated into the DNA strand as the strand is replicated through ***Polymerase Chain Reaction*** (PCR). As the DNA strand is replicated many times, each of the bases in a DNA strand can be identified.
2. Next, **carefully** cut around the outside of the chart, and then cut out each row along the dotted lines. You should have **8** strips of paper. These strips represent the copies of DNA strands of different lengths present in the reaction mixture.
3. For each strip, cut the paper to the **right** of the letter which has been coloured in. This is to model the termination of strand extension as a result of the addition of a ddNTP. The ddNTP stops strand extension because its molecular structure does not allow another nucleotide to attach next to it. The ddNTP, therefore, identifies the base at the position where the strand extension stopped.
4. Stack your strips with the longest at the bottom and the shortest at the top, then staple the stack together at the end marked **primer sequence**. Make sure that the primer sequence end is **lined up carefully!** This models the arrangement of fluorescent nucleotides as they would appear after gel electrophoresis.
5. Follow the rest of the instruction on the **DNA Sequencing – Group Consolidation** sheet.



DNA Sequencing – T (Thymine)

Instructions:

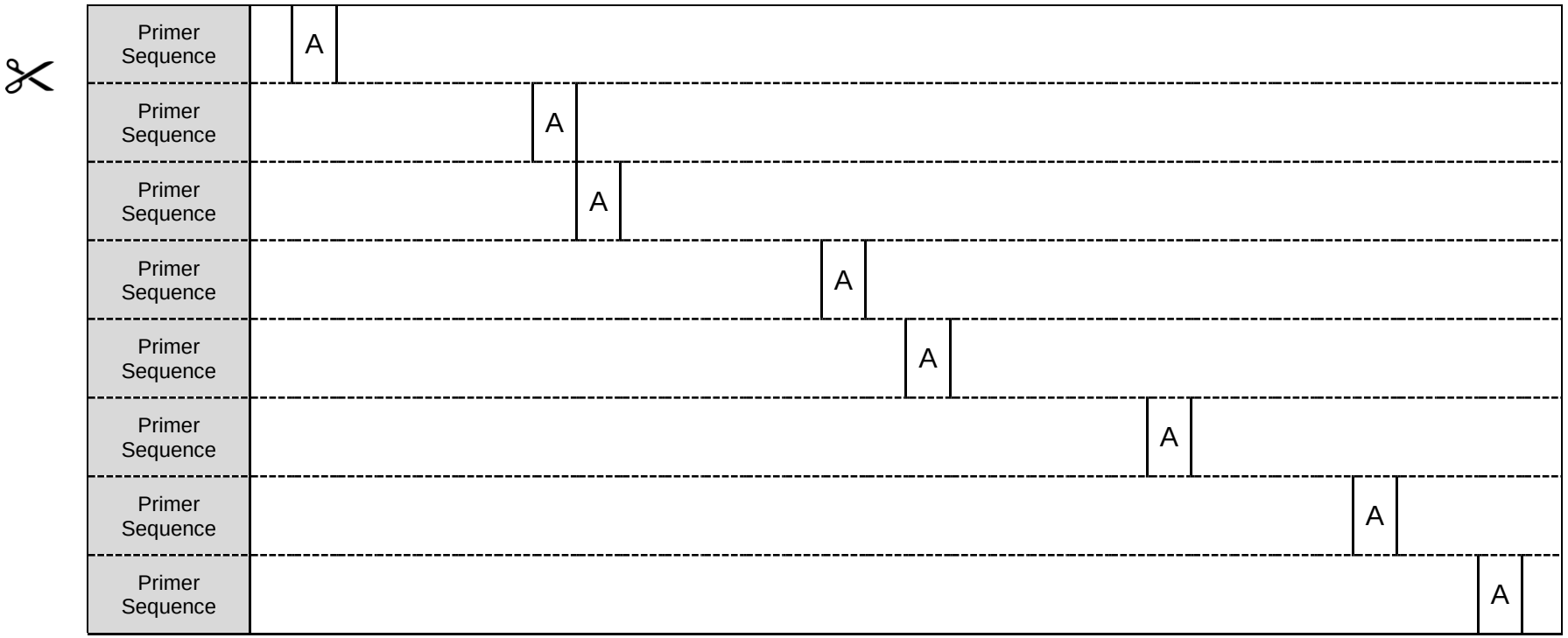
1. Colour in the boxes below for your letter in **BLUE**. This colouring represents a fluorescent dye-labelled ***dideoxynucleotide (ddNTP)*** which has been incorporated into the DNA strand as the strand is replicated through ***Polymerase Chain Reaction*** (PCR). As the DNA strand is replicated many times, each of the bases in a DNA strand can be identified.
2. Next, **carefully** cut around the outside of the chart, and then cut out each row along the dotted lines. You should have **8** strips of paper. These strips represent the copies of DNA strands of different lengths present in the reaction mixture.
3. For each strip, cut the paper to the **right** of the letter which has been coloured in. This is to model the termination of strand extension as a result of the addition of a ddNTP. The ddNTP stops strand extension because its molecular structure does not allow another nucleotide to attach next to it. The ddNTP, therefore, identifies the base at the position where the strand extension stopped.
4. Stack your strips with the longest at the bottom and the shortest at the top, then staple the stack together at the end marked **primer sequence**. Make sure that the primer sequence end is **lined up carefully!** This models the arrangement of fluorescent nucleotides as they would appear after gel electrophoresis.
5. Follow the rest of the instruction on the **DNA Sequencing – Group Consolidation** sheet.



DNA Sequencing – A (Adenine)

Instructions:

1. Colour in the boxes below for your letter in **YELLOW**. This colouring represents a fluorescent dye-labelled ***dideoxynucleotide (ddNTP)*** which has been incorporated into the DNA strand as the strand is replicated through ***Polymerase Chain Reaction*** (PCR). As the DNA strand is replicated many times, each of the bases in a DNA strand can be identified.
2. Next, **carefully** cut around the outside of the chart, and then cut out each row along the dotted lines. You should have **8** strips of paper. These strips represent the copies of DNA strands of different lengths present in the reaction mixture.
3. For each strip, cut the paper to the **right** of the letter which has been coloured in. This is to model the termination of strand extension as a result of the addition of a ddNTP. The ddNTP stops strand extension because its molecular structure does not allow another nucleotide to attach next to it. The ddNTP, therefore, identifies the base at the position where the strand extension stopped.
4. Stack your strips with the longest at the bottom and the shortest at the top, then staple the stack together at the end marked **primer sequence**. Make sure that the primer sequence end is **lined up carefully!** This models the arrangement of fluorescent nucleotides as they would appear after gel electrophoresis.
5. Follow the rest of the instruction on the **DNA Sequencing – Group Consolidation** sheet.



Group member names: _____ Date: _____

1. Lay your stapled strips in the rows as marked. Make sure you line them up carefully then tape them onto the page.
2. Reading down the columns, identify which letter is in each column. You may want to use a ruler or the edge of a piece of paper to keep the rows straight as you read. Record these letters in the row marked **complementary strand sequence**.
3. Using complementary base pairing rules (A-T, C-G), determine the **template strand sequence**.

T	Primer Sequence	*Lay strips for Thymine (T) here*
A	Primer Sequence	*Lay strips for Adenine (A) here*
C	Primer Sequence	*Lay strips for Cytosine (C) here*
G	Primer Sequence	*Lay strips for Guanine (C) here*

Complementary Strand Sequence	**5'**		**3'**
Template Strand Sequence	**3'**		**5'**