**The Brebeuf Translation Bakery**

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Brebeuf Bakery makes custom baked goods for all their students. The students are very particular about having specific items on their yummy cookies and brownies and in exactly the right order. Unfortunately, the employee who originally took all of the orders when students were admitted was a foreign exchange student, and the language he used to write down the orders must be changed into codes that the kitchen staff understands.

Your goal, as a member of the kitchen staff, is to correctly **transcribe and translate** the bakery order.

**Procedure**:

1. Obtain your bakery order from the counter employee.

2. **Transcribe each order** onto a new strip of paper into the language that the kitchen uses. Write the order number and your name onto the strip, too.

3. **Return** the original strip to the counter employee.

4. Determine where the specific bakery order begins by **locating the start sequence (AUG),** which starts each order.

5. The information before the “start order” sequence is coded for the name of the person who placed the order and only the counter clerk knows this section.

6. Create groups of letters, **codons**, on each order by drawing lines between the letters after every 3rd letter – remember not to start at the left, but to start at the “start order” sequence.

7. The order ends with one of the 3 **“stop”** sequences. The information after the stop codes for the day and time when the order was placed (only the counter employee can decode this section – do not transcribe this information).

8. Take your order strip to the assembly tables to be **translated** into a specific type of yummy baked good. Use the translation chart on the back page.

9. Sketch a side view, colored, and labeled drawing of your baked good in the space below:

10. If your order from the clerk contained a change in the first letter of the third codon after the start codon to an A. What would be different about your baked good? Be specific. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Questions:**

1. What molecule does the original “order” represent in the analogy above? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. We started our journey in the classroom. What organelle does the classroom represent? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Compare and contrast the bases in DNA and RNA. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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4. Why is only one strand of DNA needed for the conversion into RNA?

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5. What is a promoter used for in transcription? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. What represents the promoter in the analogy above and how is it different from the START codon? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. What represents the terminator sequences in the analogy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. What is an intron and an exon? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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9. Highlight the exon of your sequence strip.

10. Where in the cell is the “kitchen” located? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

11. Which organelle is represented by the “assembly table”? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

12. Why does translation in this analogy take place in the “kitchen” and not at the front counter? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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13. The sequence of letters you wrote on the paper strip represents which molecule? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

14. Explain how just 4 letters can make so many different types of baked goods? How is this similar to what really happens in transcription and translation? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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15. Procedure step 10, the change in the original order, represents what? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

16. Why would an incorrect letter change not always result in an incorrect baked good being made? Give an example.

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