Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Operon Modeling**

In this activity, your group will use Play-Do to model the *lac* and *trp* operons in prokaryotes. For each model, you will use the terms listed. Make sure that you can explain the processes in each. Make sure that everyone in your group understands the models. Teach each other! When your group is finished, I will ask your group some questions about the models. Each group member must be able to answer my questions to get full credit – this is a group grade. Make sure that you can explain what happens at the operons when tryptophan and lactose are present.

***Trp operon***

Regulatory gene (trp R)

Repressor protein

Promoter

Operator

Genes of operon (*trpE, trpD, trpC, trpB, trpA)*

Tryptophan (corepressor)

RNA polymerase

mRNA

***lac operon***

Regulatory gene (*lacI*)

Repressor protein

Promoter

Operator

Genes of operon (*lacZ, lacY, lacA)*

Lactose (inducer)

RNA polymerase

mRNA

CAP

cAMP

**Operon Rubric**

Name of group members:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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Answering question or demonstrating without assistance – 2 points

Answering question after needing prompting – 1 point

**Questions**

1. Show me or tell me what happens to transcription at the lac operon when lactose is absent and why.

 2 1 0

2. Show me or tell me what happens to transcription at the lac operon when lactose is present and why.

 2 1 0

3. Show me or tell me what happens to transcription at the *trp* operon when tryptophan is absent and why.

 2 1 0

4. Show me or tell me what happens to transcription at the *trp* operon when tryptophan is present and why.

 2 1 0

5. Show me or tell me what happens to the rate of transcription when glucose levels are high and lactose levels are low.

 2 1 0

6. Show me or tell me what happens to the rate of transcription when glucose levels are low and lactose levels are high.

 2 1 0