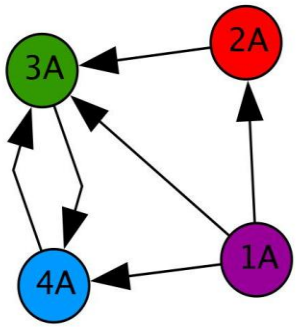
Name:_____ Teacher: _____Period:___ Date:_____

Pre-Assessment for *Environmental Influence on Gene Networks*

Instructions: *This worksheet will be used as a way to assess your understanding before you begin this new set of lessons. Please try your best to give an answer to every question, even if you need to guess. It is important for us to see where your thinking is now, before beginning new learning activities. Thank you!*

1. Use the diagram at the right to answer the following questions. Circle the best answer.



   - If the circles (nodes) in the diagram are people, how many people can 1A contact?

     0 1 2 3 4

   - How many people can contact 1A?

     0 1 2 3 4

   - How many people can contact 4A?

     0 1 2 3 4

   - If 2A sees a funny picture, who else will know about it? (Circle all that apply.)

     Nobody 1A 2A 3A 4A

   - Explain how/why a network diagram is a useful tool.

2. Various things are listed below. Place an X in front of the things that can be thought of as a system.

____aquarium ____bicycle ____pile of sand ____ocean ____box of nails

   - Explain your thinking. How did you decide whether something is a system?

3. Explain the connection between microarrays, homology searching, and biochemical pathways.

4. Students conducted an experiment to determine what causes seeds to germinate the fastest. The students used the same type of seed and water. They placed the six seeds of each test group on a paper towel in a petri dish. The data table below shows the data that they collected over several days on three groups of six seeds.

Test Group	Amount of Water	Temperature	Environmental Condition	Time of germination
1	5 ml	5°C	Dark	7 days
2	10 ml	25°C	Dark	6 days
3	15 ml	40°C	Light	4 days

What is the best conclusion based on these results? Circle the best answer.

A. The amount of water and the temperature affect the germination of the seeds.
B. The temperature and the amount of light affect the germination of the seeds.
C. The amount of water, the temperature, and the amount of light affect the germination of the seeds.
D. No conclusion can be made from this data because too many variables were changed.

What would your next experimental step be after these results?

5. Two student teams collected data as they raised the temperature in an aquarium and counted the breaths of a gold fish (per minute). Each team plans to make a line graph of their data. Which team can make a line graph AND will be more confident that their data is conclusive? Circle your answer – **Team A** or **Team B**. Also, explain your thinking in the space below Team B's table.

Data Team A	
Temp (ºC)	Breath #
18	32
20	38
22	39
24	40
26	42
28	43
30	43
32	50
34	51
36	52

Data Team B				
Temp (ºC)	Breath #	Breath #	Breath #	Breath #
18	31	32	32	31
27	43	42	43	42
36	51	52	52	51

6. What are model organisms? What characteristics make an organism a good model organism?

7. Give an example of HOW and WHY an organism responds to its environment.

8. How might an environmental factor affect the phenotype (physical characteristic) of an organism?

9. The flow of information in a cell proceeds
   A. from RNA to DNA to protein.
   B. from protein to RNA to DNA.
   C. from DNA to protein to RNA .
   D. from DNA to RNA to protein.
   E. none of the above
   F. several are correct – it varies for different organisms

10. You are a scientist studying a pair of genes (RIP and gene RAP) which encode proteins that allow bacteria to use “Sugar Rhyme” as an energy source. You notice that the genes are only active when the bacteria are exposed to “Sugar Rhyme.” Use words or a diagram to explain what may be happening.