Name _____ Class _____ Date _____

Skills Worksheet

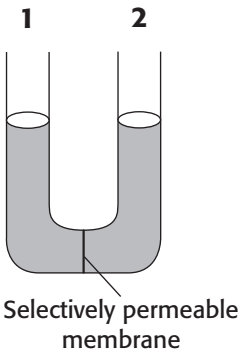
Cell Transport

PREDICTING

Use the information below and the figure at right to answer questions 1–3.

EXPERIMENT A

A selectively permeable membrane separates the solutions in the arms of the U-tube shown at right. The membrane is permeable to water and to substance A but not to substance B. Forty grams of substance A and 20 g of substance B have been added to the water on side 1 of the U-tube. Twenty grams of substance A and 40 g of substance B have been added to the water on side 2 of the U-tube. Assume that after a period of time, the solutions on either side of the membrane have reached equilibrium.



Read each question, and write your answer in the space provided.

1. How many grams of substance A will be in solution on side 1 of the U-tube? How many grams of substance A will be in solution on side 2? Explain.

2. How many grams of substance B will be in solution on side 1 of the U-tube? How many grams of substance B will be in solution on side 2? Explain.

3. What has happened to the water level in the U-tube? Explain.

Use the information below to answer questions 4–6.

EXPERIMENT B

The cell membrane of red blood cells is permeable to water but not to sodium chloride, NaCl. Suppose that you have three flasks:

- Flask X contains a solution that is 0.5 percent NaCl.
- Flask Y contains a solution that is 0.9 percent NaCl.
- Flask Z contains a solution that is 1.5 percent NaCl.

To each flask, you add red blood cells, which contain a solution that is 0.9 percent NaCl.

Read each question, and write your answer in the space provided.

4. Predict what will happen to the red blood cells in flask X.

5. Predict what will happen to the red blood cells in flask Y.

6. Predict what will happen to the red blood cells in flask Z.

Cell Transport

PREDICTING

1. Thirty grams of substance A will be in solution on side 1, and 30 g will be in solution on side 2. Because the membrane is permeable to substance A, diffusion will take place. Molecules of substance A will move from the side of the membrane where they are less concentrated until equilibrium is reached.
2. The original 20 g of substance B will remain in solution on side 1, and the original 40 g will remain in solution on side 2 because substance B cannot pass through the membrane.
3. The water level will be higher on side 2 of the U-tube. As substance A molecules move across the membrane from side 1 to side 2, there will be more dissolved molecules on side 2 than on side 1. This will cause water to move across the membrane by osmosis from side 1 to side 2.
4. The cells will swell and will take in water until they and the flask solution are isotonic.
5. The cells will remain the same size because the solutions are isotonic.
6. The cells will shrink, and water will move out of the cells until they and the flask solution are isotonic.

Cell Cycle and Mitosis

SEQUENCING

1. b
2. e
3. g
4. a
5. d
6. h
7. c
8. f
9. anaphase
10. telophase
11. metaphase
12. prophase
13. 3
14. 2
15. 4
16. 1

Meiosis

SEQUENCING/ORGANIZING INFORMATION

1. g
2. b
3. c
4. f
5. h
6. d
7. a
8. e
9. g
10. a
11. d
12. f
13. c
14. h
15. e
16. b

Genetics

ANALYZING EXPERIMENTS

1. **a.** *R*
   b. *R*
   c. *r*
   d. *Rr*
   e. *Rr*
   f. *r*
   g. *Rr*
   h. *Rr*
   i. *R*
   j. *r*
   k. *R*
   l. *RR*
   m. *Rr*
   n. *r*
   o. Rr
   p. *rr*
2. Only one phenotype is present—plants with round seeds; only one genotype is present—*Rr*.
3. There are two phenotypes present—round seeds and wrinkled seeds. They are present in the ratio of three with round seeds to one with wrinkled seeds.
4. Mendel's hypothesis is supported by this analysis. When both the *R* and *r* alleles appeared together, only the dominant phenotype was expressed (round seeds).
5. Mendel probably did not observe an exact ratio of 3:1. These numbers represent probabilities. For example, there is a 75 percent chance that any one offspring will have the round phenotype. Assuming Mendel obtained large numbers of offspring to analyze, he would have calculated a ratio of approximately 3:1.