

Investigation 4 Diffusion and Osmosis

Procedure 1. Page S55 Read then answer the 3 bulleted questions:

- What is the shape of these cells?
- What size are the cells?
- How do small intestinal epithelial and root hair cells function in nutrient procurement?

Step 1. You will be observing a demonstration. Both tubes have phenolphthalein in the tubes. A solution is added to each.

- Which solution is an acid?
- Which solution is a base?
- Which solution did the phenolphthalein react as an indicator?

Step 2. Cut three different size blocks of agar of different sizes, yet small. They should be small enough to fit in the dishes provided and be able to be completely covered with the solution. If you make your blocks too big, this will take too long, and you will not obtain results during this period.

These three blocks will be your models for cells.

- What is the surface area of each of your three cells?
Block 1: Block 2: Block 3:
- What is the total volume of each of your cells?
Block 1: Block 2: Block 3:
- PREDICTION: If you put each of the blocks into a solution, into which block would that solution diffuse throughout the entire block fastest?
- Slowest?
- How do you explain the difference? (Surface area to volume ratio and the relationship with diffusion and your cells should be stated)

Page S 56 DESIGN AND CONDUCT AN EXPERIMENT TO TEST YOUR PREDICTION:

Use the materials we have been using to design an experiment to test the predictions you just made regarding the relationship of surface area and volume in the artificial cells to the diffusion rate using the Phenolphthalein, NaOH, and HCl or Vinegar.

Record your results.

Block 1: Time Block 2: Time Block 3: Time

Do your experimental results support your predictions?

