Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Period: \_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Cell Defense: The Plasma Membrane**

**Directions:** Go to **https://goo.gl/fjr16W**. Read the steps here and all the information on the screen. Follow all the steps carefully filling in all the blanks.

**Step 1:** Scroll down and click “**Start a New Game!**” then “**Click Here to Continue!**” Select **“Build a Membrane!”** Dr. Vial has a vile weapon (note the play on words) that destroys plasma membranes. Without the \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells of living things will die because they are unable to maintain \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Step 2: Click Spacebar to Continue** to zoom in on the plasma membrane. Observe. Then, click **Spacebar to Continue.** From the **“Urgent Message”** you learn that phospholipids are made of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Head and \_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ TAILS.

The heads are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The tails are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which means \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The heads face out towards the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the tails facing \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_.

**Draw and label** the phospholipid in the box to the right:

**Click “I understand!”,** Read the “Urgent Message” and click it again.

**Step 3:** Repair the phospholipid membrane.

How many phospholipids did it take? \_\_\_\_\_\_\_

**Step 4:** What do you have to put into the membrane in order to help stabilize it?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ How many did you add? \_\_\_\_\_

**Step 5:** What is another word for selectively permeable? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

What does that mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Step 6:** What 2 molecules easily pass through the membrane? Record why for each.

|  |  |
| --- | --- |
| Molecule 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Why? | Molecule 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Why? |

**Step 7:** What 3 molecules cannot easily pass through the membrane? Record why for each.

|  |  |  |
| --- | --- | --- |
| Molecule 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Why? | Molecule 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Why? | Molecule 3: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Why? |

What does polar mean? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 8:** Insert channel proteins into the membrane. Transport substances across the membrane. Note: You can only transport substances using channel proteins until there were

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. What is this process called? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 9:** Moving from \_\_\_\_\_\_ to \_\_\_\_\_\_\_ concentration requires the use of energy to \_\_\_\_\_\_\_\_\_ substances. This is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ transport and uses: (place answer in table)

|  |  |
| --- | --- |
| 1. | 2.  Which is cell \_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Step 10:** Carbohydrates are like identification badges. Cells that have different membrane carbohydrates do different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The immune system uses the carbohydrates to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that your cells belong to \_\_\_\_\_\_\_\_ and are not \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or other foreign cells.

What does the immune system do to foreign invaders? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What kind of cell does this? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 11:** Next take the “Membrane Structure Challenge!”

**Step 12:** Take the “Diffusion Challenge!”

How many O­2 molecules did you move? \_\_\_\_\_\_\_\_\_\_ CO2 molecules? \_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 13:** Take the “Energy and Transport Challenge!”

How many ATP did you use? \_\_\_\_\_\_ What type(s) of protein(s) were used? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Explain when each type of protein was used. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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

**Step 14:** Take the “Osmosis Challenge!”

What is Osmosis? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What is the name of the special proteins that let water pass through? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Is this passive or active transport? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Step 15: Click on Score Sheet** and record your information below.

**Lab Score (% correct): \_\_\_\_\_\_\_\_\_\_\_\_**

**Number Correct: \_\_\_\_\_\_\_**

**Number Incorrect: \_\_\_\_\_\_\_**