Front COVER:
The Plasma Membrane

- fluid mosaic model, semi-permeable (selectively permeable), double layer of phospholipids with embedded proteins

Jobs of the cell membrane

- Isolate the cytoplasm from the external environment
- Regulate the exchange of substances
- Communicate with other cells
- Identification

Phospholipids contain a phosphate head (that is hydrophilic) and a nonpolar fatty acid tail (which is hydrophobic), which creates a barrier.

DIRECTIONS: Read the following information and label your front cover. Use the colored pencils color the PHOSPHOLIPIDS. Use blue for the “heads” and yellow for the “fatty acid tails”. Make sure to indicate if they are hydrophobic=afraid of water or hydrophilic=love water
Pages 1-2 Homeostasis

Directions: Watch the video and answers the questions.

https://youtu.be/6fhbbFd4icY
Cell Membrane and Transport

**Diffusion**
- The movement of molecules from an area of high concentration to an area of low concentration
- Molecules tend to “spread out” and equalize
- Requires no energy

**Osmosis**
- The diffusion of water across a membrane
- The cell membrane is selectively permeable and water

**Facilitated Diffusion:**
- The process of passive transport of molecules or ions across a cell’s membrane
- Molecules travel through a channel or carrier protein

**Directions:** Match the structure/process to the letter. Color your diagram as follows:

- Blue=Phospholipid head
- Yellow=Fatty acid tail
- Green=Oxygen
- Light Blue=Water
- Purple=Channel Protein
- Orange=Glucose
Directions: Explore the following web pages and complete the Venn Diagram on Cell Transport. Place the numbers from each statement into the correct location on the Venn Diagram.
Directions: Watch the video on cell transport. Use the following words/phrases to complete the graphic organizer.

<table>
<thead>
<tr>
<th>No energy</th>
<th>Facilitated diffusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitated diffusion</td>
<td>Low → High</td>
</tr>
<tr>
<td>High → Low</td>
<td>Passive</td>
</tr>
<tr>
<td>Active</td>
<td></td>
</tr>
<tr>
<td>ATP</td>
<td></td>
</tr>
</tbody>
</table>
Transport through the plasma membrane

Can be...

Which requires...

ENERGY

ATP

To move materials from...

(Against the gradient)

Can be...

Which requires...

NO ENERGY

EXAMPLES

Osmosis

Diffusion

Facilitated Diffusion

To move materials from...

(W/ the gradient)
Directions: Use the root word cards to infer the meaning of the vocabulary cards.
<table>
<thead>
<tr>
<th>Root, Prefix, or Suffix</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cyto—</strong></td>
<td>Cell</td>
</tr>
<tr>
<td><strong>Endo—</strong></td>
<td>Inside</td>
</tr>
<tr>
<td><strong>Exo—</strong></td>
<td>Outside</td>
</tr>
<tr>
<td><strong>Hyper—</strong></td>
<td>High</td>
</tr>
<tr>
<td><strong>Hypo—</strong></td>
<td>Low</td>
</tr>
<tr>
<td><strong>Iso—</strong></td>
<td>Equal</td>
</tr>
<tr>
<td>- tonic</td>
<td>Solution concentration</td>
</tr>
<tr>
<td>- sis</td>
<td>Action or process</td>
</tr>
</tbody>
</table>
Draw a small molecule going through the membrane quickly. Show it going through the channel protein, which makes a tunnel.

Since a plasma membrane is like a border of a country, picking who gets to come into the cell and who doesn’t,
I'm a plasma membrane. I'm selectively permeable. Which means I'm choosy about what enters and exits my cell.

I'm a transport protein called a carrier protein. I pick up molecules from one side of the membrane and take them to the other side.

I'm a protein called a receptor. My job is to detect signals from the outside of the cell and relay those signals to the inside.
Directions: Use the Biology4Kids web page and learn about active transport. After reading the pages on active transport, complete the picture on page 12.

1. Label a phospholipid.
2. Draw an arrow indicating the direction that molecules will move.
3. Circle yes or no for use of energy.
4. Summarize each type of transport.

(Use other pages to assist you if needed.)
<table>
<thead>
<tr>
<th>Name</th>
<th>Type of Transport</th>
<th>Direction of Movement</th>
<th>Conditions</th>
<th>Energy?</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diffusion</td>
<td>passive</td>
<td>HIGH to LOW</td>
<td>No membrane, Semipermeable membrane</td>
<td>NO</td>
<td>Water, gases (O₂ and CO₂), and steroid hormones.</td>
</tr>
<tr>
<td>Facilitated Diffusion</td>
<td>passive</td>
<td>HIGH to LOW</td>
<td>Protein Channel</td>
<td>NO</td>
<td>Water, glucose, and amino acids.</td>
</tr>
<tr>
<td>Osmosis</td>
<td>passive</td>
<td>HIGH to LOW</td>
<td>Semipermeable membrane</td>
<td>NO</td>
<td>Water Only!</td>
</tr>
<tr>
<td>Active Transport</td>
<td>active</td>
<td>LOW to HIGH</td>
<td>Protein pump and ATP energy</td>
<td>YES</td>
<td>Ions, sugars, and amino acids.</td>
</tr>
</tbody>
</table>
Directions: Scan the QR code (android only) or use the computer to run the simulation on Osmosis. Read the note pages. After reading the pages, label the pictures of the blood cells. Then on page 14, label the pictures showing the direction the water moves and what will happen to the cell. Make sure you do the question over the simulation.

http://bcs.whfreeman.com/webpub/biology/Bres1e/Activities/Exercise_5-Activity_3a/bres_osmosis.html

Salt SUCKS

Rule for Osmosis
• If the area outside the cell has more salt – then water will be sucked out of the cell
• If the area inside the cell has more salt - then water will be sucked into the cell

Isotonic Solutions
• “ISO" means the same
• Amount of dissolved material is the same inside and outside the cell
“Hypo" means less

• Amount of dissolved material is less outside the cell
• Cells without a cell wall will swell and may burst in this solution
• Cells with a cell wall will swell, but once firm the cell wall prevents any more water from entering the cell

Hyper" means more

• Amount of dissolved material is more outside the cell
• Cells without cell walls will shrink or die • Cells with cell walls will shrivel; the membrane will pull away from the cell wall
• No cells like this solution and in both cases they may die