

LESSON TITLE: Cell Transport and Homeostasis GRADE: 9-12

Amount of Preparation Needed Prior to Class: 20-30 minutes (Lab preparation and setup)

Click here for the resource page on the website (login required): [Cell Transport](#)

Learning/Lesson Plan

Standards:

NGSS: [HS-LS1-1 From Molecules to Organisms: Structures and Processes](#)

HS-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

Objective(s):

(What will a student know [content] and be able to do [skills/process]?)

- Identify and describe the cell structures involved in the transport of materials into, out of, and throughout a cell
- Explain mechanisms that permit organisms to maintain biological balance between their internal and external environments
- Describe how the structure of the plasma membrane allows it to function as a regulatory structure and/or protective barrier for the cell
- Compare the mechanisms of transport across the cell membrane
- Describe how membrane bound organelles facilitate the transport of materials within a cell
- Explain how organisms maintain homeostasis.

Essential Question(s):

- How is the cell organized to maintain homeostasis in all organisms?
- Explain how the organelles work together to provide functions for the organism.

Assessments Summative and Formative

(What strategies will be employed? How will we know instruction has been successful?)

1. Student responses during class discussions
2. Bell Ringers
3. Exit tickets
4. Quizzes
5. Test
6. Wilted Plant Lab

Materials Needed

red onion

potato

Microscope- per station

microscope slide with cover slips

paper towel

disposable pipettes

distilled or tap water

20% salt solution-instructions to make this are in the lab in the teacher notes on the last page.

10% salt solution- instructions to make this are in the lab in the teacher notes on the last page.

1 Graduated cylinder- per station

3 test tubes-per station

ruler

Balance

Marker

plastic wrap or parafilm

test tube rack-per station

distilled water

scented spray (febreeze works well)

Internet Access with youtube (or download video prior to class) and Projector (for animations and video clips)

Setting the Stage/Beginning the Lesson/Engagement*

(How will new learning be introduced? How will students get motivated/excited regarding new learning? How will prior knowledge be tapped and assessed?)

Day 1 BR Engagement: Teacher will stand in front of the class and spray a scented spray (Febreze works well). The teacher will ask the students to raise their hand when they smell the Febreze. Teacher will then discuss how the molecules diffuse from a high concentration to a low concentration. (Note: this example is not true diffusion though it helps students understand the concept. You may want to mention that true diffusion takes much longer and convection is what is moving the molecules in this example)

Day 2 BR: Students will complete the problem on [slide 13](#) of the Cell Transport and Homeostasis PPT. Answers: Beaker A-hypotonic, Beaker B-isotonic, Beaker C-hypertonic

Day 3 BR: Students will complete the [Red Onion Cell Bell Ringer](#).

Day 4 BR: Students will complete the [Sucrose Concentrations Graphing BR](#).

Day 5 BR- Students will complete the [Silent Reading on Cell Transport](#).

Day 6- If needed- Students will complete the [Cell Transport Practice Problems](#).

Acquisition of Skills/Developing the Lesson/Exploration*/Explanation*/Elaboration*
(What will Modeling, Guided Practice, Independent Practice, and Checking for Understanding look like?)

Day 1:

1. The teacher will review the Power point presentation titled "[Cell Transport and Homeostasis](#)" up to slide 12.
2. Students will complete the [guided notes slides 1-12](#).
3. Students will begin [Analysis of the Wilted Plants Lab](#). Students may only have time to read the scenario and procedures. Have students complete this independently. Emphasize reading for understanding.

Day 2:

1. The students will complete [Part 1 of the Wilted Plant Lab](#).

Day 3:

1. The teacher will present slides 13-20. [Students will complete the guided notes](#).
2. Teacher will play the video on the [sodium potassium pump](#) on slide 17.
3. Students will begin part 2 of the Wilted Plant Lab time permitting.

Day 4:

1. Students will complete [part 2 day 1 of the lab](#).

Day 5

1. Students will complete Part 2 Day of [the Wilted plant lab](#).
2. Students will complete the [Cell Transport Graphic Organizer](#).

Day 6-If Needed

1. Finish up anything the student may need extra time to complete.

Day 7-ASSESSMENT ([choose your version here](#))

Closing the Lesson/Summary of Learning/Evaluation*

(How will learning be explained, summarized, applied to assure student understanding?)

Day 1 – The teacher will use the name cards to call on student and ask specific questions about part one of the lab procedure and overall objective of the Wilted Plant lab.

Day 2 - Students will be asked to stand up if they are wearing a certain color. Students will share one thing that they learned, have a question about or found interesting during their lab experience.

Day 3 – Students will gather their materials for the Part 2 of lab. This will save you time in having to do it all yourself. If you have more than one section you can have the students verify the materials. Students could also make the solution being used 10% salt and 20% salt.

Day 4 – Using the name cards, pull a few names and have them ask one question about cell transport that they do not understand. Give the student time to think and write down their response before calling on them. Address their questions as they come up.

Day 5 – Go over the Go Over the Cell Transport Graphic Organizer. Use the name cards to call on students.

Day 6 (if needed)- Use the beach ball to review cell transport vocabulary

Differentiating the Lesson

Differentiations will be based on students' needs:

Higher Differentiation- 2-3 days– Have the students build a 3D model of a cell membrane with the sodium potassium pump. Student can present their model and describe how works.

Lower Differentiation - The teacher should offer more guided one on one instruction whenever possible. Have the students spend extra time identifying the structure and functions. Modify assignments by reducing the length, extending time or chunking the

assignment. The teacher may need to extend the unit 2 days to allow more time for students to practice. Student may also benefit from model building depending on their learning style.

Learning/Lesson Reflection

(What went well? What may need revision the next time I use this lesson? How did students react? etc.)

Learning/Lesson Extension

(What web sites, references, field experiences, related topics, or activities might offer enriched or enhanced learning opportunities?)

1. Have students model the movement of molecules using yarn to represent the cell membrane and small printed water molecules and some solute.
2. Provide more practice examples using an [excellent worksheet created by a Mr. Croft.](#)