

LESSON TITLE: Cell Structure and Function GRADE: 9-12

Amount of Preparation Needed Prior to Class: 20-30 minutes (see Plant and Animal Microscope lab- prep and supplies required.)

If cell boxes are not made add 15 minutes/set or have students build them.

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

Learning/Lesson Plan

Standards:

NGSS: **HS-LS1-1 From Molecules to Organisms: Structures and Processes**

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells. (building knowledge base to get to this objective)

HS-LS1- 2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. (building to the systems level)

Objective(s):

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

- Describe the history of cell theory and the scientists responsible for it.
- Describe the relationship between the cell shape and the cell function.
- Explain mechanisms that allow organisms to maintain homeostasis.
- Identify and Explain the various functions of cell organelles.

Essential Question(s):

1. **How is the cell organized to maintain homeostasis in all organisms?**
2. **How do the organelles work together to allow the organism to functions?**

Assessments Summative and Formative

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

1. Student responses during class discussions
2. Exit tickets
3. Quizzes
4. Test
5. Cell Boxing Activity

Materials Needed

(Include materials for the basic lesson)

Cell Boxes (constructed)

Scissors

Glue/Tape

Sidewalk Chalk

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

Computer or devices that have “ Adobe flash” to run various animations

For Lab-

- Microscopes, Allium (Onion Root Tip Slide, animal cell slide)

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 show the students a picture/video microscope of the piece of cork. [Slide 1 of the Cell PPT for a picture.](#)

Day 2 BR: Students will complete the [Day 2 Microscope Bell Ringer.](#)
Answers (A-7, B-6, C-5, D-1, E-2, F-4, G-3)

Day 3 BR: Cell Lesson Day 3 Bell Ringer – [Chromatin vs Nucleolus vs Chromosomes](#)

Day 4 BR: Students will watch the youtube video on “[protein trafficking](#)”. The class will discuss the path of the protein. Use the name cards to randomly call on students. Going further: You can play the video twice and have the students narrated the video the second time with the video on mute. (the video does go into more detail than students need to know for the assessment. They just need to understand how proteins are transported and the organelles involved.

Day 5 BR- [Extended bell ringer- Students will complete the Cell labeling practice BR.](#)

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 PPT](#)".
2. Students will complete the [guided notes slides 1-11](#).
3. Students will begin the plants and animal cell microscope lab.

Day 2:

1. The teacher will [present slides 12-15](#). Students will complete their guided notes.
2. Students will continue [the Plant and Animal Cell Microscope Lab](#).

Day 3:

1. The teacher will [present slides \(16-27\) on the cells PPT](#). Students will complete the guided notes.
2. Students will complete the [Plant and Animal Cell Microscope Lab](#) if they have not yet finished.
3. Students will review the [Cell Structures and Functions using the Cell Boxing Activity](#).

Day 4:

1. Students will complete the [cell sidewalk chalk activity](#) (You can also complete this activity as a poster activity however, students will be much more engaged using the sidewalk and chalk or even chalk on the lab tables.)
 - a. If you do not think students will complete it in one day check the weather to be sure they can complete the activity. Students have completed it easily in 45 minutes, however.

Day 5/6-Review Day(s)

1. After the students have completed the cell [labeling BR practice](#) the teacher will go over the answers using the cell labeling BR key.
2. For review students will complete the [cell organelle webquest](#).

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 - Students will complete the cell day 1 [exit ticket](#) using their notes.

Day 2 - Student will complete the [microscope labeling quiz](#) or use the beach ball to review cell organelles.

Day 3 –Students will complete the cell boxing activity or [beach ball activity](#). Change up the words daily as needed.

Day 4 – Using the names cards, pull a few names and have them ask one question about cell 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 –Students will write down one thing they learned or remembered from the day. Use the name cards and have students share their answers. -or beach ball review with cell organelles.

Day 6 (if needed)- Use the beach ball to review cell organelles.

Differentiating the Lesson

Differentiations will be based on students' needs:

Higher Differentiation – Have students research a certain type of specialized cell (i.e. nerve cell, bone cell, muscle cell) , build a 3D model and describe how it has specialized structures that allow it to do its job best.

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.

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 complete a graphic organizer for cells.
2. Show students more animations or videos to offer a different perspective.
3. Cell personification: Describe the function of a cell organelle/structure of your choice as if you are the organelle. For example "Hello, I am a ribosome. I like to spend my day wandering around the cytoplasm of cell looking to meet up with my friends mRNA. ect. ect." Your description must be at least 200 words and include the structural description (5 points), the function (5 points).
4. Students could create a story, rap or poem about the cells and share it with the class.