Animal cell

Grade/ Grade Band: 6th grade	**Topic:** Animal cell	**Lesson #** 4 **in a series of** 4 **lessons**

Brief Lesson Description:

During this unit, students will learn about animal cells and functions of animal cell. Students will able to identify major organelles of animal cell 1. Nucleus 2. Mitochondria 3. Ribosome 4. Cell membrane and their important functions. Students will understand tissue, organ, organ system and organism.

Performance Expectation(s):

This is what you want your students to be able to do and know at the completion of the lesson. These should be measurable and clearly the focus of the lesson.

MS-LS1-2: Develop and use a model to describe the function of a cell as a whole and ways the parts of cells contribute to the function. [Clarification Statement: Emphasis is on the cell functioning as a whole system and the primary role of identified parts of the cell, specifically the nucleus, chloroplasts, mitochondria, cell membrane, and cell wall.]

Specific Learning Outcomes:

1. The notion of cell
2. Different organelles of animal cells
3. Functions of animal cells
4. Tissues
5. Organs
6. Organ system
7. Organism
8. Basic programming of EV3.

Narrative / Background Information

Prior Student Knowledge:

1. Knowledge of cell.
2. Basic functions of cell.
3. Basic understanding of mechanical parts of LEGO EV3
4. Basic programming of EV3

Science & Engineering Practices (SEPs)	Disciplinary Core Ideas (DCIs)	Crosscutting Concepts (CCs)
Developing and Using Models Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more phenomena that are abstract and design systems. • Develop and use a model to describe phenomena.	**LS1.A: Structure and Function** • Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.	**Structure and Function** • Complex and microscopic structures and systems can be visualized, modeled, and used to describe how their function depends on the relationships among its parts, therefore complex natural structures/systems can be analyzed to determine how they function.

Possible Preconceptions/Misconceptions:

- Do not know about cell
- Don not know about cell division
- Difference between plant cell and animal cell

LESSON PLAN – 5-E Model

ENGAGE: Opening Activity – Access Prior Learning / Stimulate Interest / Generate Questions:

The teacher opens the class showing students the picture of life cycle of Monarch butterfly and human.

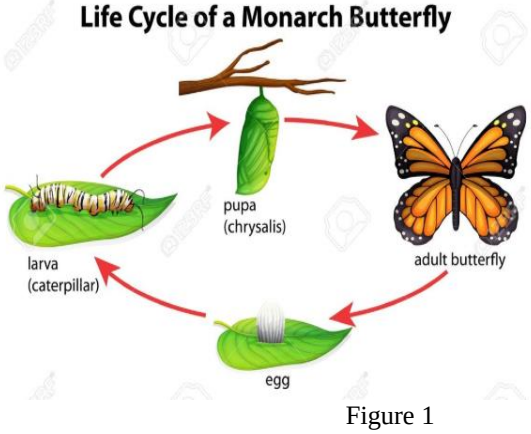


Figure 1

Figure 1 credit : mskkendrick.weebly.com

- What is the growth stages of monarch butterfly?
- How larva forms from egg?
- Ask students what is cell?

(Expected answer: The building block of living organisms, and the smallest unit that can perform all the life processes)

- Ask studens what are the organelles of animal cells?

  Direct students to get the answer (Cells are made up of a nucleus and a cytoplasm, enclosed by a thin wall called a membrane, which separates it from its surrounding) (Aligned with MS-LS-1-2 since it address the DCI of of this standrad by asking the facts that cell is made up of special structures and the cell membranes form the boundary that controls what enters and leaves the cell)

EXPLORE: Lesson Description – Materials Needed / Probing or Clarifying Questions:

Show students the picture below

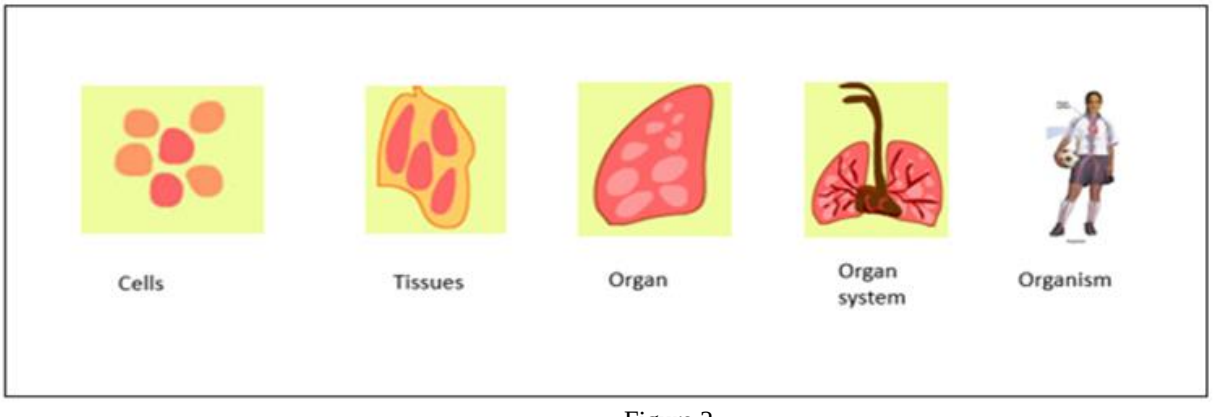


Figure 2

Figure 2 credit : http://eschooltoday.com

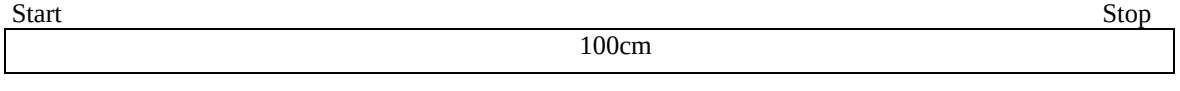
Ask them what is the connection between cells ,tissues and organ,organ system and organism in animals ?

Activity 1 :

Give students the following materials.

1.Lego Ev3 robot
2. Masking tape
3. Meter stick
4. Worksheet

Step1: Measure 1-meter long masking tape and tape it on the center of the table



Step 2: Cut 5 pieces of 1-inch long masking tape and label each one as either Cells,tissue,organ,organ system and Organism. Keep it aside.

Step3: Place the robot on start(and keep the first label on start which is cell) and run the cell_activity1 program. Monitor the

movement of the robot.

Step4 : At the end of each 25cm, the bot will alert you by name of that part. It will pause for 2 secs. Place the label on the path of the robot for the respective name to denote the cells forms tissues.

Step5: When the robot reaches each stages ,it will produce sound,speak and display the name.

- This activity address SEP of the lesson since it use a model to describe the phenomenon of formation of organism from
  animal cell.
- This activity implicitly address DCI of the standard MS-LS-1-2 since it deals with structure and function and formation of
  an animal from a cell is the function of the cell.
- This activity address the CCC of the standard MS-LS-1-2 since complex microscopic structure and system can be visualized,modeled and used to describe how their functions depends on the relation amoung its parts .

EXPLAIN: Concepts Explained and Vocabulary Defined:

Ask students what the important organells of animal cell ?

-Give students an insight of nucleus,mitochondria,rhibosome and cell membrane

Actvity 2 :

1. Draw of cell strcture on chart paper.
2. Cell structure includes nucleus ,mitochondria,ribosomes, and cell membrane
3. Cut 4 pieces of 1-inch long masking tape and label each one as either nucleus,mitochondria,ribosome and cell membrane. Keep it aside
4. Give different colors to this organells
5. Run the program cell_activity 2 Program.
6. Let Lego robot will find different orgenells in the cell structure
7. When it find each organells,robot will stop,display the name and speak the name and function.

Materials :

1.Lego Ev3 robot
3. Chart paper
4.Worksheet

Ask students to write the name of the organells,draw shape of organells and the purpose of organells.

Name of organells	Shape of organell	Purpose

- This activity address SEP of the lesson since it use a model to describe the structure of animal cell.
- This activity implicitly address DCI of the standard MS-LS-1-2 since it deals with structure and function of cells.Within cells,special structures are responsible for particular functions,and cell membranes form the boundary .
- This activity address the CCC of the standard MS-LS-1-2 since complex microscopic structure and system can be visualized,modeled and used to describe how their functions depends on the relation amoung its parts .The complex system can be analysed to determine how they function.

Vocabulary:
Cell
Cell membrane
Animal cell
Nucleus
Cytoplasm
Ribosome
Mitochondria
DNA
Tissues
Organs
Organ system
Organism

ELABORATE: Applications and Extensions:

Activity 3:

-Introduce plant cell to students.

-Ask students what is the difference between animal cell and plant cell?

1. Draw of cell strcture on chart paper.
2. Cell structure includes nucleus ,mitochondria,ribosomes, and cell wall.
3. Cut 5 pieces of 1-inch long masking tape and label each one as either nucleus,mitochondria,ribosome,chloroplast and cell wall. Keep it aside
4. Give different colors to this organells
5. Run the program cell_activity 3 Program.
6. Let Lego robot will find different orgenells in the cell structure
7. When it find each organells,robot will stop,display the name and speak the name and function.

Name of organells	Shape of organells	Purpose

- This activity address SEP of the lesson since it use a model to describe the structure of plant cell.
- This activity implicitly address DCI of the standard MS-LS-1-2 since it deals with structure and function of cells.Within cells,special structures are responsible for particular functions,and cell membranes form the boundary .
- This activity address the CCC of the standard MS-LS-1-2 since complex microscopic structure and system can be visualized,modeled and used to describe how their functions depends on the relation amoung its parts .The complex system can be analysed to determine how they function.

EVALUATE:

2. **Ask students to raise their hand and give real life connection with this organells ?**

(one expected answer let your school as cell,then nucleus is Principal,security is the cell membrane etc)

3. **Ask them what happen if these cell organells are not function properly ?**

Formative Monitoring (Questioning / Discussion):

Exit Cards: (if we have enough time)

• 1 thing you learned that you didn't already know

• 1 thing that you already knew

• 1 question that you still have

- These questions address SEPs since it uses a model to describe the phenomenon.
- These questions address CCCs since it analyzes the complex system and how it functions
- These questions address DCI of the system since special structures of cells are responsible for particular function.

Elaborate Further / Reflect: Enrichment:

Materials Required for This Lesson/Activity			
Quantity	**Description**	**Potential Supplier (item #)**	**Estimated Price**
	Laptop		
	Lego Mindstorm kit		
	Masking tape		
	Meter stick		

1. https://www.youtube.com/watch?v=MfopLilIOeA
2. https://www.youtube.com/watch?v=URUJD5NEXC8
3. http://eschooltoday.com/science/characteristics-of-living-organisms/all-living-organisms-are-made-up-of-cells.html