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| Title: Introduction to Cells as Building Blocks of Life |
| **Date: February 13, 2014** |
| **Grade Level: Grade 8 Science** |
| **IRP and PLO (with page #) B2- relate the main features and properties of cells to their functions** |
| General purpose/Goals/AimIntroduce cell theory and Louis Pasteur in a fun and memorable way |
| **Specific Objectives (SWBAT) (number each objective)*** **Summarize 3 aspects of cell theory**
* **Recognize Louis Pasteur and have a basic understanding of his accomplishments**
 |
| **Background knowledge/information required****BC Science 8 Textbook pg. 30-31****View Louis Pasteur Video on blog** | **Setup/Safety (if any)****prepare video, prepare Louis Pasteur costume and experiment materials** |
| Pre-assessment, probing of previous knowledgeWhat were the 5 characteristic of living things? Are viruses living or non-living? Do you need all 5 characteristics to be considered a living organism? |
| **OBJ.** | Time5-10 min.10 min. | Teacher Activity**Review:*** **Have students write down answers to following questions:**
* What were the 5 characteristics of living things?
* Do you need all 5 characteristics to be considered a living organism?

**Hook + Presentation:*** Cell video: Introduction to cells
* Introduce concept of spontaneous generation through a PowerPoint
* Introduce beliefs of Aristotle and pneuma
 | Questions/DialogueIs a computer a living thing?Is a sunflower a living thing?“People had no idea microorganisms existed”“We now know we are all made of cells, but back in the past, things weren’t as clear”“Aristotle thought that all non-living things contained pneuma, or “vital heat”  | Materials/AidsSmall sheets of paper for reviewYoutube videoPowerPoint |
| **OBJ.** | Time10 min.10 min.10-15 min.10 min.5 min. | Teacher Activity**Role-play van Helmont:*** Role-play as van Helmont and recreate his experiments
* Put various objects inside box to see if any mice have grown (spontaneous generation is true!)
* **Think-Pair-Share:** What errors could you find in val Helmont’s experiment? What would you have done to improve his experiment? (Draw it out on whiteboard)
* **Students will share their answers**

**Recreate Pasteur’s experiment:*** Recreate Louis Pasteur’s experiment to show bacteria couldn’t grow inside flasks
* Yellow beaker represents broth
* Green liquid beaker represents broth after bacteria
1. Pour yellow “broth” into 2 flasks
2. Put them onto hot plate to recreate boiling
3. Leave one flask open, one flask with long neck
4. Show that open flask has turned green given time
5. Remove long neck and show that it has turned green as well
* Ask students to make predictions before proceeding to step 4
* **What is your conclusion?**

**Pasteur Worksheet:*** Distribute worksheet that details Pasteur’s experiment
* Go over worksheet with students

**Cell Theory:*** On whiteboard: Cell is basic unit of life, all organism are composed of one or more cells, all cells come from other cells
* Basic unit of life: A cell is required to be considered living
* All organism are composed of cells, all animals, plants, bacteria
* Cells are formed during cell division
* Distribute notes and questions on cell theory

**Conclusion:*** Go over what has been learned
* **Have students write reflection in notebook:** **2 thing learned, 1 thing curious about**
 | Questions/Dialogue“Vital heat could generate living things. Different nonliving material with different amounts of vital heat could produce different organisms. For example, clams and scallops grew out of sand, maggots grew out of meat”Hello! My name is Jan Baptist van Helmont, and I want to prove to you that mice can appear out of thin air!**Questions:** **What errors could you find in van Helmont’s experiments?****What would you have done to improve his experiments?****What do you expect the results to be?****Questions:** **What is your prediction? What happens to broth in open flask? What happens to broth in long necked flask?****What if I remove the long neck and leave it out?****What is your conclusion?** | Materials/AidsBox, t-shirt, wheat/flour, computer mouse2 erlenmeyer flasks1 beaker with yellow-coloured water1 beaker with green-coloured water2 flasks of water with yellow food colouring1 flask of water with green food colouringHot plate |
| EvaluationSummative: Worksheet checked for completion the next dayFormative: Cooperation and participation in group collaboration activities |
| References and background readingBC Science 8 pg. 31-32 | Extension ActivitiesLouis Pasteur activity sheetRead BC Science 8 pg. 25-29 |
| Notes to self© Amir Atabeygi 2005 |