

Introduction:

Well, there is no better way to discover how to build a lesson plan using the **NGS Standards** than to start to build one without any assistance or background to see just what elements and methods might need to be developed and included. So what follows is my first attempt. As a biologist I used a middle school version of the most fundamental DCI (*Discipline Core Idea*) *From Molecules to Organisms: Structures and Processes* (MS-LS1-1), isolating it using this interactive NGSS website (<http://www.nextgenscience.org/search-performance-expectations>) and selecting Middle School/grades 6-8 in the Grade Band/Level drop-down menu, and LS1A in the Disciplinary Core Ideas drop-down menu followed by selecting Apply. Then I watched this video (<http://www.youtube.com/watch?v=jHCwYpt5CDw>) for the LS1A DCI to get a feeling for the progression of this core idea through all grade levels (K-12) listening for the 6-8 grade band in particular.

Next, I started an electronic document working from the most basic, most fundamental, organizing information so that this plan can be used by others, updated and categorized for future use.

Eventually (with your help) I would like to develop a graphic organizer template (in Word and Adobe) that could be used (K-12) for the instructors of science that work at the LCER to use for creating a searchable lesson and unit plan bank.

More information and Resources can be found at the following Internet locations:

- **On Facebook @ Science Education at the Lewis Center for Educational Research** (<https://www.facebook.com/scienceatlcer>)
- **Under the “Main Menu” category On Moodle @** https://crypt.lewiscenter.org/webapps/moodle_aae/
- **LCER.org→AAE→Departments→Science→Teaching Science [NGSS & CC]** (<http://www.lewiscenter.org/AAE/Departments/Science/Teaching-Science-NGSS--CC/index.html#NGSS: Planning For a Full Implimentation of California%27s Version of the NGSS>)

Good luck! Please send and ideas or comments to mhuffine@lcer.org

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“One of the penalties of an ecological education is that one lives alone in a world of wounds An ecologist must either harden his shell and make believe that the consequences of science are none of his business, or he must be the doctor who sees the marks of death in a community that believes itself well and does not want to be told otherwise.” **Aldo Leopold in "Round River" 1953**

Water Wise Education Moodle: <http://www.waterwiseeducation.org>

Mojave Water Education Kiosk: <http://hegel.lewiscenter.org/users/mhuffine/mwak/mwakfs1.htm>

Blogs: "Working with Mohave tui chub" Blog <http://lcermtcrefugia.blogspot.com/>

" Mojave River Wildlands Rehabilitation Project" <http://mojaveriverwildlandsrehabresearch.blogspot.com/>

Subject/Course: 7th Grade Life Science
Grade Level/Band: 7th
Lesson Author: Matthew Huffine
Date Created: 7/29/2013

Unit Name: The “Basic” of Life Science (TBD)

Lesson Name: What are the basic units and scales of life?
Lesson Duration: TBD

DCI (*Discipline Core Idea*) Code (top gray header, left): MS-LS1-1

DCI Description (top gray header, middle): From Molecules to Organisms: Structures and Processes

BIG IDEA(s): When is something alive/living? What is the basic unit of life? What is a basic unit? The nature of scale and how it applies to living things.

Performance Expectation (white box) for... MS-LS1-1.1

Students who demonstrate understanding can: Conduct an **investigation** to provide **evidence** that **living things** are made of **cells**; either one cell or many different numbers and types of cells. [**Clarification Statement:** Emphasis is on **developing evidence** that living things are made of cells, **distinguishing between living and non-living cells**, and understanding that living things may be made of **one** cell (unicellular) or **many** (multicellular) and varied cells.]

Derived Questions:

1. What determines if something is alive/living/formerly alive, biotic?
 - a. What are the characteristics of something that is alive?
2. What determines if something is not living/not alive/ has never been alive, abiotic?
3. What is a cell?
 - a. How would you know you are looking at one?
 - b. How would you go about finding them and looking at them?
 - c. What are the different kinds of assemblages that cells can be found in?

Derived Activity:

1. Do research, collecting information, learning vocabulary about cells and the characteristics of living and non living things
2. Developing a working hypothesis about the visual (macro/micro) characteristic of living things.
3. Making a collection of various “living”/ formerly living things to analyze
4. Investigation (testing the hypothesis) using a hand lens

5. Investigation (testing the hypothesis) using a microscope

Reading(s) (textbook, article, handout etc.) that supports this Lesson: TBD

Type of Inquiry Used¹ (check one or more):

- Open or “Full” Inquiry
- Guided Inquiry
- Coupled Inquiry
- Structured Inquiry
- None (inquiry will not be used in this lesson)

Possible Existing Activities/Lessons/experiments That Could be used:

- http://www.exploratorium.edu/imaging-station/activities/classroom/characteristics/ca_characteristics.php
- <http://www.mysciencebox.org/book/export/html/432>
- http://www.teachersdomain.org/resource/tdc02.sci.life.colt.lp_living/
- http://www.cas.miamioh.edu/scienceforohio/Living_Nonliving/L.html

Existing Audio/Visual/Animation/Simulation Resources that could be used:

- http://www.teachersdomain.org/asset/tdc02_vid_singlecell/
- For scale, I used this web page (https://crypt.lewiscenter.org/webapps/moodle_aae/mod/resource/view.php?inpopup=true&id=31004) one that I just started to put together to bank needed Flash files and web-links and checked out “The Scale of Things and Time” category to see what was available under

Possible Misconceptions: TBD

Materials: TBD

Science and Engineering Practice (blue box): *Planning and Carrying Out Investigations*: Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation.

DCI (middle orange box) : *LS1.A: Structure and Function* All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).

¹ Use this resource to get a further description of each of these kinds of inquiry:
<http://www.lewiscenter.org/documents/AAE/Science/Teaching%20Science/Types%20of%20Inquiry.pdf>

Derived Lesson Augmentation: develop a minimal vocabulary list using the current text making sure that the key words in the DCI have been included:

Crosscutting Concept (green box) : *Scale, Proportion, and Quantity*

Phenomena that can be observed at one scale may not be observable at another scale.

Derived Lesson Augmentation: Introduce / re introduce students to basic units of metric length down to micrometers (um) before introducing them to a scale applet or flash animation that will help them visualize the concept scale as it applies to a human organism and the cells that one is composed of.

Connections to Engineering, Technology and Applications of Science :
Interdependence of Science, Engineering, and Technology

Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems.

Derived Lesson Augmentation: Introduce / re introduce students the technologies that they will be using to conduct their experiment (i.e. lens, microscopes, Flash, Applets (small micro browser-based applications) etc.)

Connection(s) to CCELA (Common Core English Language Arts) : Reading for information, writing a summary of research.

Connection(s) to CCM (Common Core Math) : Learning to work with metric measuring units and how they are used to reference to the “scale” of things.

Possible Misconceptions:

Assess students' understanding (and identify possible misconceptions) by asking:

- Are all things that move "alive"? Have them defend their opinions by referring to the results of their explorations.
- What kinds of nonliving things move?
- How is the movement of living things different from the movement of nonliving things?
- Do all living things move?
- What kinds of living things move?
- What kinds don't move?
- Do plants move?
- Why do living things move?