NGSS Rubrics Cell Analogy Assessment: Teacher Instructions

Introduction:
The **NGSS Rubrics** *Cell Analogy Assessment* is an assessment activity that assesses learning goals unpacked from NGSS MS-LS1-2. It assesses the following learning goals related to the structure and function of cells and developing models.
Identify cell nucleus (DCI)
Identify cell membrane (DCI)
Identify cell wall (DCI)
Identify mitochondria (DCI)
Identify chloroplast (DCI)
State function of cell nucleus (DCI)
State function of cell membrane (DCI)
State function of cell wall (DCI)
State function of mitochondria (DCI)
State function of chloroplast (DCI)
Distinguish between plant cells and animal cells (DCI)
Developing Models (SEP)
Evaluate Limitations of a model (SEP) Note this NGSS learning goal is not part of MS-LS1-2

Background Information.
The **NGSS Rubrics** *Cell Analogy Assessment* is adapted from an assessment task developed by NYS Master Teacher Derek Srygley. Students can complete the assessment task on a computer or the teacher can print copies for students to complete by hand. The assessment task will take between 20 to 40 minutes for most middle school students to complete. Test modifications may change that time for some students.

When administering the assessment, distribute the response sheet to students. Consider any time constraints you may have to allow time for all students to finish. If students cannot finish in time, collect their work and schedule a time to complete the assessment or allow them to stay longer to complete it. Tell students that, except for where they are simply stating a structure, their written responses must be recorded as complete sentences, that is, complete thoughts. Finally, encourage students to ask questions if words or instructions are not clear.

This is not a typical quiz. We are not trying to generate grades for students. Rather, we are trying to see how well they have attained each of the learning goals related to MS-LS1-2. This is the information that will be generated from this activity. Creating a record of this information can be as simple as attaching a rating form to the student response sheet. The attached rating form can be used by teacher or student or both. For teachers who are interested we can provide access to an assessment information system that will display levels of student attainment of each of the learning goals over time.**   Alternatively, a simple summary of levels of student attainment, such as many teachers use for their gradebooks (figure 1) can be set up before scoring by entering learning goals just as you would enter the titles of assignments. This

will allow the rater to quickly enter ratings for a class of students without having to copy ratings from a separate rating document.

Figure 1: A sample grade book set up to record student ratings from an administration of the Cell Analogy Assessment.

	Nucleus ID (DCI)	Cell Membrane ID (DCI)	Cell Wall ID (DCI)	Mitochondria ID (DCI)	Chloroplast ID (DCI)	Nucleus Function (DCI)	Cell Membrane Function (DCI)	Cell Wall Function (DCI)	Mitochondria Function (DCI)	Chloroplast Function (DCI)	Plant Cell vs. Animal Cell (DCI)	System of Parts (CCC)	Developing Models (SEP)	Limitations of a Model (SEP)
Student 1	1	1	1	1	1	1	2	2	3	3	1	1	2	1
Student 2	1	1	1	1	1	1	0	1	2	1	1	1	1	0
Student 3	1	0	0	0	0	1	1	1	0	2	0	1	2	0
Student 4	1	1	1	0	1	3	2	0	1	2	1	0	1	1

Script for introducing students to the Cell Analogy Assessment

[A script like the following helps to standardize the assessment so that students in different classes are receiving the same set of instructions. For teachers who are not constrained to give grades based on student level of attainment of standards another script is available]

Teacher: Scientists use models to explain and understand systems or objects that are difficult to directly observe. Sometimes these models are analogies that compare a natural object or system to something we are more familiar with. Often scientific models have limitations that prevent them from accurately representing the original object or system. Does everyone know what *a model* is? And what about *an analogy*? Do you know what a *limitation* is?

Pause to field students' questions.   It is okay to answer the questions above because their definitions are not the learning goals being measured on this assessment.

Teacher: When you take part in this assessment activity, you will be doing what scientists do. You will be doing the things that we just discussed. Notice that some of your responses will be given in a table while others are not. Be sure to complete each part of this assessment?

Pause to field students' questions.

Teacher: This assessment activity will be different from what you do in many of your classes in another way. I want to know how far along you are at meeting specific learning goals. Rather than receiving a grade for the assessment, you will be rated on how far along you are with each learning goal. You will also receive a grade for completing the assessment, for writing in complete sentences where appropriate and for making your writing neat and clear. I want your

answers to be complete thoughts so I can fully understand what you are thinking. I want you to complete the whole assessment. To conclude, please complete the whole assessment, write neatly and clearly and use full sentences. What questions do you have before we begin?

Pause to field students' questions.

Teacher: Let's begin