

STEM LITERACY C&I CONNECTIONS

JUNE 2018

**PRIORITIZED
STANDARDS**

**ASSESSMENT
EFFECTIVE**

**STUDENT
ENGAGEMENT**

COURSE CONNECTIONS

Guiding Question #1

**At the end of each course,
what are your students
expected to know and do?**

COLLABORATIVE APPROACH

Why is collaboration critical?

The background features a stylized line art illustration of two people in conversation. The person on the left is shown in profile, with a large speech bubble containing the text 'Why is collaboration critical?'. The person on the right is also in profile, facing the first person. The lines are simple and grey, set against a dark background.

COLLABORATIVE APPROACH

Why is collaboration critical?

- ✓ **Shared Understanding**
- ✓ **Professional Disagreement**
- ✓ **Cooperative Consensus**

COLLABORATIVE APPROACH

Who are your potential collaborative partners?

The background features a dark, textured surface with faint, stylized line art of several human figures. Some figures are shown in profile, while others are more abstract, suggesting a group of people in a collaborative or conversational setting. The lines are light gray and blend into the dark background.

STAGE ONE

LEARNING OBJECTIVE

ASSESSMENT METHODS

INSTRUCTIONAL ACTIVITIES

DIFFERENTIATION OPTIONS

NECESSARY RESOURCES

Identify the desired result.

**What should students know,
understand, and be able to do?
What is worthy of understanding?
What enduring understandings
are desired?**

- ❖ **Consider goals**
- ❖ **Examine content standards**
- ❖ **Review curricular expectations**
- ❖ **Consider student interests**

COLLABORATIVE APPROACH

What drives your curriculum?

Science: MLS or NGSS?

Math: Updated '16 MLS?

Unwrapping/Curriculum Planning Template

Content Area:

Grade/Course:

Standard *(ID or actual text)*

Critical aspect *(How does this standard fit into the learning sequence?)*

Student-/parent-friendly version

Priority Concerns

- Endurance**
Value beyond the test?
- Leverage**
Value in other disciplines?
- Readiness**
Needed for next level?

Knowledge *(Important nouns)*

Skills *(Verbs)*

Vocabulary
(Academic and domain-specific)

COLLABORATIVE APPROACH

To what degree do you and your coworkers have a shared understanding of the learning objectives?

MARZANO (@ MCREL) FINDINGS

- ❖ **200 standards and 3,093 benchmarks**
- ❖ **15,465 hours to adequately address**
- ❖ **5.5 to 6.0 hours per day in classrooms**
- ❖ **21% to 69% of time is instructional**
- ❖ **180 school days, 5.6 hours per day, 69% effectiveness**
- ❖ **9,042 hours of instruction**

“Given the limited time you have with your students, curriculum design has become more and more an issue of deciding what you won’t teach as well as what you will teach. You cannot do it all. As a [curriculum] designer, you must choose the essential.”

–Heidi Hayes Jacobs

COURSE CONNECTIONS

Guiding Question #2

**For each course you teach,
which content is most
important? Which content
is unimportant?**

ESSENTIAL LEARNING OUTCOMES

**OBJECTIVES THAT COVER
CRITICAL CONTENT TO BE
MASTERED BY ALL STUDENTS**

**OBJECTIVES THAT COVER ADDITIONAL
IMPORTANT CONCEPTS AND SKILLS**

**OBJECTIVES THAT COVER OTHER THINGS
THAT ARE NICE TO KNOW**

AINSWORTH PROTOCOL

- **Endurance**
 - **Does the learning objective provide value beyond the current instructional period (course, grade, etc.)?**
- **Leverage**
 - **Does the objective provide value across a variety of additional disciplines?**
- **Readiness**
 - **Does the objective provide knowledge/skill required for the next level of learning?**

**Solve problems using
information presented in
line plots, picture graphs,
and bar graphs.**

**Tell and write time from
analog and digital clocks to
the nearest five minutes,
using a.m. and p.m.**

Find the volume and surface area of prisms, pyramids, and cylinders.

Compare the numerical measures of center, measures of frequency and measures of variability from two random samples to draw inferences about the population.

First Quarter

Month(s)	August-September	September	September-October	
Topic/Concept	Introduction to Biology: -Characteristics of Life -Experimental Design	Introduction to Ecology -Biosphere	Ecology -Populations & Communities -Population Growth & Limits -Symbiosis -Succession	Ecosystems -Energy -Food Webs -Chemical Cycles -People & the Environment
Learner Objectives	<p>Level I: SC7.1.A.a-d SC7.1.A.g SC7.1.B.b-e SC7.1.C.a-d SC7.1.D.a SC7.1.D.c</p> <p>Level II: SC7.1.A.e-f SC7.1.B.a SC8.1.B.a SC8.3.B.b</p> <p>Level III: SC3.1.C.a SC6.1.B.a SC8.3.B.a SC7.1.B.f SC8.3.B.c SC7.1.D.b SC8.3.C.a-c SC8.2.A.a-b SC8.3.D.a</p>	<p>Level III: SC4.1.B.b SC6.1.B.a</p>	<p>Level I: SC4.1.A.a-b SC4.1.B.a SC4.1.D.a SC7.1.B.b</p> <p>Level II: SC4.1.A.c</p> <p>Level III: SC4.1.B.b SC4.3.B.a SC5.3.A.a-b</p>	<p>Level I: SC4.1.A.a-b SC4.1.B.a SC4.1.D.a SC7.1.B.b</p> <p>Level II: SC4.1.A.c</p> <p>Level III: SC4.1.B.b SC4.3.B.a SC5.3.A.a-b</p>
Resources	Holt Biology Textbook Nature Items Lab Equipment Powerpoint/Projector Smart Board Overhead Projector	Holt Biology Textbook Powerpoint/Projector Smartboard Overhead Projector	Holt Biology Textbook Powerpoint/Projector Smartboard Lab Equipment Whiteboards	Holt Biology Textbook Powerpoint/Projector Smartboard Computer Food Chains "An Incomplete Newswatch Species . . . Wildlife

When reviewing and prioritizing standards, consult:

- **Professional judgment (you and your team)**
- **Missouri state testing blueprints**
- **Item Analysis Summary documents**
- **Professional organizations (e.g., MoCTM, STOM, etc.)**
- **Curricula from other school districts**



**Missouri Assessment Program
2017 Item Analysis Summary
HALLSVILLE R-IV (010089)**

9 SPRING 2017 School: HALLSVILLE HIGH (1050) Examiner: School Overall

10 Science Grade: B1

11 * Science has two forms. Sessions 1 & 2 are unique. Session 3 has common items. Student counts will vary.

MLS Code	MLS Category/Focus	Session	DOK	QT	Student Count*	Pts. Poss. per Item	% Pts. Earned
EC.1.A.	a. Explain the nature of interactions between organisms in predator/prey relationships and different symbiotic relationships (i.e., mutualism, commensalisms, parasitism)	1	Recall	MC	92	1	74%
		1	Recall	MC	92	1	79%
		1	Recall	MC	92	1	92%
EC.1.B.	a. Identify and explain the limiting factors (biotic and abiotic) that may affect the carrying capacity of a population within an ecosystem	1	Skill/Concept	MC	92	1	80%
		1	Skill/Concept	MC	92	1	87%
		1	Skill/Concept	MC	92	1	82%
EC.1.D.	a. Predict the impact (beneficial or harmful) a natural environmental event (e.g., forest fire, flood, volcanic eruption, avalanche) or human caused change (e.g., acid rain, global warming, pollution, deforestation, introduction of an exotic species) may have on the diversity of different species in an ecosystem	1	Skill/Concept	MC	92	1	82%
		1	Skill/Concept	MC	92	1	86%
		1	Skill/Concept	MC	92	1	65%
EC.2.A.	c. Predict how the use and flow of energy will be altered due to changes in a food web	1	Skill/Concept	MC	92	1	86%
		1	Skill/Concept	MC	92	1	65%
		1	Skill/Concept	MC	92	1	99%
EC.3.B.	b. Explain the importance of reproduction to the survival of a species (i.e., the failure of a species to reproduce will lead to extinction of that species)	1	Recall	MC	92	1	99%
		1	Skill/Concept	MC	92	1	90%
		1	Skill/Concept	MC	92	1	73%
EC.3.C.	a. Identify examples of adaptations that may have resulted from variations favored by natural selection (e.g., long-necked giraffes, long-eared jack rabbits) and describe how that variation may have provided populations an advantage for survival	1	Skill/Concept	MC	92	1	73%
		1	Skill/Concept	MC	92	1	86%
		1	Skill/Concept	MC	92	1	83%
IN.1.A.	a. Formulate testable questions and hypotheses	2	Strategic Thinking	CR	92	1	66%
		2	Strategic Thinking	CR	92	1	66%
		2	Skill/Concept	CR	92	1	51%
		2	Strategic Thinking	CR	92	3	49%
		2	Strategic Thinking	CR	92	3	49%
		2	Skill/Concept	CR	92	3	81%
IN.1.B.	c. Determine the appropriate tools and techniques to collect, analyze, and interpret data	2	Skill/Concept	CR	92	3	81%
		2	Strategic Thinking	CR	92	1	99%
		2	Strategic Thinking	CR	92	1	100%
IN.1.C.	b. Analyze experimental data to determine patterns, relationships, perspectives, and credibility of explanations (e.g., predict/extrapolate data, explain the relationship between the independent and dependent variable)	2	Strategic Thinking	CR	92	1	99%
		2	Strategic Thinking	CR	92	1	100%
		2	Strategic Thinking	CR	92	2	57%
IN.1.D.	a. Communicate the procedures and results of investigations and explanations through:	2	Strategic Thinking	CR	92	4	67%
LO.1.B.	a. Recognize cells both increase in number and differentiate, becoming specialized in structure and function, during and after embryonic development	1	Recall	MC	92	1	63%
		1	Skill/Concept	MC	92	1	88%
LO.1.C.	b. Describe the structure of cell parts (e.g., cell wall, cell membrane, cytoplasm, nucleus, chloroplast, mitochondrion, ribosome, vacuole) found in different types of cells (e.g., bacterial, plant, skin, nerve, blood, muscle) and the functions they perform (e.g., structural support, transport of materials, storage of genetic information, photosynthesis and cellular respiration)	1	Skill/Concept	MC	92	1	61%
		1	Skill/Concept	MC	92	1	53%
LO.2.A.	c. Explain physical and chemical interactions that occur between organelles (e.g. nucleus, cell membrane, chloroplast, mitochondrion, ribosome) as they carry out life processes	1	Skill/Concept	MC	92	1	53%
		1	Skill/Concept	MC	92	1	39%
		1	Skill/Concept	MC	92	1	46%
LO.2.B.	a. Explain the interrelationship between the processes of photosynthesis and cellular respiration (e.g., recycling of oxygen and carbon dioxide), comparing and contrasting photosynthesis and cellular respiration reactions (Do NOT assess intermediate reactions)	1	Skill/Concept	MC	92	1	39%
		1	Skill/Concept	MC	92	1	46%
		1	Skill/Concept	MC	92	1	93%
LO.2.F.	a. Explain the significance of the selectively permeable membrane to the transport of molecules	1	Skill/Concept	MC	92	1	76%
		1	Skill/Concept	MC	92	1	53%
		1	Skill/Concept	MC	92	1	54%
		1	Recall	MC	92	1	52%
LO.3.B.	a. Describe the chemical and structural properties of DNA (e.g., DNA is a large polymer formed from linked subunits of four kinds of nitrogen bases; genetic information is encoded in genes based on the sequence of subunits; each DNA molecule in a cell for	1	Recall	MC	92	1	90%
		1	Recall	MC	92	1	28%
		1	Skill/Concept	MC	92	1	89%
		1	Skill/Concept	MC	92	1	48%
LO.3.C.	a. Recognize the chromosomes of daughter cells, formed through the processes of asexual reproduction and mitosis, the formation of somatic (body) cells in multicellular organisms, are identical to the chromosomes of the parent cell	1	Recall	MC	92	1	38%
		1	Recall	MC	92	1	28%
		1	Skill/Concept	MC	92	1	64%
		1	Skill/Concept	MC	92	1	45%

N.1.A FORMULATE TESTABLE QUESTIONS AND HYPOTHESES

COLLABORATIVE APPROACH

Where is your school or district in this process? Is there shared clarity on priority standards?

ALIGNMENT OF EMPHASIS

IMPORTANCE OF LEARNING OBJECTIVES



INSTRUCTIONAL TIME SPENT



DISTRIBUTED PRACTICE (INCLUDES HOMEWORK ASSIGNMENTS)



POINTS AWARDED



Objective 1

Objective 2

Objective 3

Objective 4

ALIGNMENT OF EMPHASIS

IMPORTANCE OF LEARNING OBJECTIVES



INSTRUCTIONAL TIME SPENT



DISTRIBUTED PRACTICE (INCLUDES HOMEWORK ASSIGNMENTS)



POINTS AWARDED



Objective 1

Objective 2

Objective 3

Objective 4

STAGE TWO

LEARNING OBJECTIVE

ASSESSMENT METHODS

INSTRUCTIONAL ACTIVITIES

DIFFERENTIATION OPTIONS

NECESSARY RESOURCES

Determine acceptable evidence.

How will we know if students have achieved the desired results and met the standards? What will we accept as evidence of student understanding and proficiency?

- ❖ **Consider a range of informal and formal assessments during a unit**
- ❖ **Think like an assessor before designing specific units and lessons**

COURSE CONNECTIONS

Guiding Question #3

**What evidence of learning
do you demand from your
students?**

Diagnostic Pre-Assessment

Typically administered before learning, to determine who already knows what

Differentiated Learning Activities

Maintain focus on priority objectives

Formative Assessment

Pre-tests, surveys, K-W-L or similar strategies

Summative Assessment

Useful for planning instruction, selecting resources, and preparing differentiation options

NOT graded

Diagnostic Pre-Assessment

Typically administered during instruction

Differentiated Learning Activities

Used by teacher to identify learning gaps and plan next instructional moves

Formative Assessment

Used by student to monitor own progress and set goals for learning

Formal (e.g., quiz, homework) and informal (e.g., questioning, observation) methods

Summative Assessment

Normally NOT graded

	Jan 5 Exit Slip (4)	Jan 7 Quiz (7)	Jan 11 Activity (4)
Damien	3	6	4
Suzie	1	2	2
Francis	3	6	
Jane		1	1
Isabella	4	7	3
Johnny	3	4	2
Paul	1	7	1

STUDENT SELF-EVAL AND GOAL SETTING

Students learn at greater than three times the typical rate when they can:

- ✓ **Communicate the learning objective**
- ✓ **Explain the success criteria**
- ✓ **Identify their current position relative to the success criteria**
- ✓ **Express one or more action steps to move themselves toward success**

Diagnostic Pre-Assessment

**Differentiated
Learning Activities**

Formative Assessment

Summative Assessment

**Typically administered
after learning to assess
student learning, and the
quality of curriculum and
instruction**

**Usually formal methods,
including quizzes, tests,
projects, papers,
portfolios, etc.**

Often graded

COURSE CONNECTIONS

Guiding Question #4a

How might you expand use of literacy strategies within your assessment plan?

STAGE THREE

LEARNING OBJECTIVE

ASSESSMENT METHODS

INSTRUCTIONAL ACTIVITIES

DIFFERENTIATION OPTIONS

NECESSARY RESOURCES

Plan the learning experiences.

- ❖ **What activities will equip students with the needed knowledge (facts, concepts, and principles) and skills (procedures)?**
- ❖ **What will need to be taught and coached, and how should it be presented?**
- ❖ **What materials and resources are best suited to accomplish these goals?**

COURSE CONNECTIONS

Guiding Question #4b

How might you expand use of literacy strategies within your instruction?

NEXT STEPS?

Write about your current reality and potential next actions. What's to be done? First steps?

- ✓ **Shared understanding of standards**
- ✓ **Consensus on priorities (high to low)**
- ✓ **Alignment between standards, instructional time, grades, etc.**
- ✓ **Student feedback and goal setting**
- ✓ **Spots where increased literacy will immediately improve CIA**

CONTACT

John Downs

jdowns@hallsville.org

www.hallsville.org/

[ims/jdowns/](http://www.hallsville.org/ims/jdowns/)