

Upper Valley Linkages for Environmental Literacy (UVLEL)

Unit Roadmap

Your unit write-up should provide enough basic information to give others a good sense of what you did and how, including answers to these prompts. Aside from being accountable to this project, another purpose of this document is to provide an outline to a potential grade level colleague to replicate your teaching/learning experience. We've posted a few samples of past units at <http://www.fwni.org/34.html>.

Teacher name: Teriko MacConnell

Grade level: 3

Unit title: How Big is That Tree?

Length of Unit (days/periods): 5 30-45 minute lessons

Timeline Lessons delivered April

Goals of this unit

Estimating

Extending math thinking

Relative mathematics

Scientific process skills

Create a 'trailer' video using iMovie

Essential questions addressed (worded in student-friendly format)

Big Idea: Sustainability – Economic and Natural

EQ: How and why do experts determine which trees to cut and which to let grow?

Activities to support learning targets (include brief write-ups, or simply source citations if commonly available)

Lesson 1 (1/2 hour)

The forester described his job – helping people manage their trees/lots/forests

He makes recommendations based on what the people want –

- Wildlife
- Fire wood (make a model of a cord to show its size)
- Lumber
- Paper (weight)

He demonstrated the tools foresters use to determine how big a tree is, and explained why this is an important skill.

Then he set the tone saying that next time he visited, he would show them a super-secret method of telling the height of a tree without cutting it down, and they would all learn how to do it, just like a real forester!

Students were put into groups for the following day's work and were given 'jobs': stick wielder, measurer, recorder, documenter, and measurer 2.

Lesson 2 (1/2+ hour, Outside)

The forester demonstrated the method on a small tree, then checked it with a telescoping measuring stick to prove that the method works.

The students then tried it out for themselves on a huge tree

The jobs kept the students focused and cooperative, the task kept the students enthusiastic and they got accurate estimates, as well!

Lesson 3

Returning to the classroom, the students took the data they collected from the huge tree and looked at the tables to discover how many board feet, pounds and cords were in the tree.

The students found the number of board feet that could come from the tree and compared their number with that of other groups.

They also found the number of cords and compared that with the model of a cord of wood that I had set up.

Lessons 4 and 5 Technology class (40 minutes each)

Ms. O., the technology teacher and I, introduced the term 'trailer' and explained what the students would be creating.

We developed the words to guide them

Once we showed them how to maneuver and choose photos/video, they took off and did the rest within their group!

Assessments of learning (how will you document student learning and assess whether students are able to answer the essential questions and have achieved target GE/GSEs?) Students will complete a "worksheet" detailing their math and science thinking and then present their findings to their peers. The worksheet and presentation will be collected and evaluated for understanding using a rubric.

Key GEs/GSEs assessed (include both content and process learning targets)

3.MD.2 Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. Measure and estimate liquid volumes and masses of objects using standard units...Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units by using drawings to represent the problem.

Mathematical Practice.2 – Reason abstractly and quantitatively. Mathematically proficient students make sense of quantities and their relationships in problem situations.... Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

Mathematical Practice.5 – Use appropriate tools strategically. Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, etc. They are able to use technological tools to explore and deepen their understanding of concepts.

3-ESS3-1 Engaging in an Argument from Evidence

NH Technology Standard: 3b. Students use productivity tools to collaborate in constructing technology-enhanced models, prepare publications, and produce other creative works.

Supporting resources (websites, book titles, videos, human resources, etc.)

Project Learning Tree

LSPA personnel

Sullivan County Forester, Dode Gladders

Colby-Sawyer College Media Specialist Intern, Tien Le

Attachments

Assessment rubric

Forester's Tables

How Big is That Tree?

Rubric

Names of Group Members: _____

Classroom Teacher: _____

	1 No evidence of meeting the standard	2 Working toward meeting the standard	3 Meeting the standard	4 Meeting the Standard with distinction
Teamwork	Students do not cooperate or collaborate	Students generally cooperate and collaborate but with extra help	Students cooperate and collaborate and solve problems together	Students cooperate, collaborate, solve problems together and help others
Data Sheet and Measurement	No evidence of students using the data sheet. Students show little evidence of using the stick method correctly or the measuring tape appropriately	Data sheet was used, but missing information. Students used the tools (stick and meas. Tape) appropriately but errors were made.	Data sheet complete. Students performed and recorded the measurements accurately	Data sheet complete with extra notes. Students performed and recorded the measurements accurately
Estimate Bloom's: 'Understanding' the process of estimating	Students did not show evidence of estimating height and/or diameter	Students showed evidence of understanding the process of estimating	Students made an estimate for height and diameter	Students made an estimate for height and diameter and made notes about the process
Tables Bloom's: 'Applying'	Students attempted the tables, but were not successful in finding board feet, cords, or weight	Students found part of the information by using the tables	Students used the tables appropriately to figure out the board feet, weight, and cords of a tree	Students used the tables appropriately to figure out the board feet, weight, and cords of a tree with explanations
Comparing Bloom's: 'Analyzing'	Students show no evidence of comparing their data to their classmates' data	Students attempt to compare data, but did not justify that their conclusion is reasonable	Students are able to compare the results of their group's estimate with their peer's estimates and justify if they are reasonable	Students are able to compare the results of their group's estimate with their peer's estimates and justify if they are reasonable and if not, explain why not.
Technology Bloom's: 'Creating'	Project has technology glitches. Students show responsibility when working with the iPad with adult guidance	Project has only minor errors. Students show responsibility when working with the iPad	Project runs smoothly and uses many features of the iMovie app. Students show responsibility when working with the iPad	Project runs smoothly and uses many features of the app to support the presentation logically. Students show responsibility when working with the iPad

Names of Group Members _____

DATA SHEET

Species	Diameter	Height		Board Feet	Cords	Tons
		Total	Usable			

Table 1: Board Feet

Diameter	Usable Height					
	10	20	30	40	50	60
12"	30	70	100	120		-
14"	40	95	140	160	180	-
16"	60	125	180	210	250	295
18"	70	165	240	280	320	380
20"	90	205	300	350	400	475
22"	110	250	360	430	490	585
24"	130	300	430	510	590	700
26"	160	355	510	600	700	835
28"	190	415	600	700	810	970
30"	220	480	690	810	930	1,120
32"	260	555	790	940	1,080	1,290
34"	290	630	900	1,060	1,220	1,460
36"	330	710	1,010	1,200	1,380	1,650

Table 2: Cords

Diameter	Total Height								
	20	30	40	50	60	70	80	90	100
6"	0.03	0.05	0.07	0.09	0.11				
8"	0.05	0.08	0.11	0.14	0.19				
10"		0.12	0.16	0.20	0.24	0.28	0.32		
12"			0.22	0.27	0.33	0.43	0.5		
14"			0.28	0.35	0.50	0.57	0.64		
16"				0.45	0.54	0.72	0.81		
18"				0.55	0.67	0.77	0.88	1.0	1.1
20"				0.67	0.81	0.94	1.1	1.2	1.3
22"				0.80	0.96	1.1	1.3	1.4	1.6
24"					1.1	1.3	1.5	1.7	1.9
26"					1.3	1.5	1.7	1.9	2.1
28"					1.5	1.7	2.0	2.2	2.5
30"					1.7	2.0	2.3	2.6	2.8
32"						2.2	2.6	2.9	3.2
34"						2.5	2.9	3.2	3.6
36"						2.8	3.2	3.6	4.0

Table 3: Pounds

Diameter	Total Height								
	20	30	40	50	60	70	80	90	100
6"	150	250	350	450	550				
8"	250	400	550	700	950				
10"		600	800	1,000	1,200	1,400	1,600		
12"			1,100	1,350	1,650	2,150	2,500		
14"			1,400	1,750	2,500	2,850	3,200		
16"				2,250	2,700	3,600	4,050		
18"				2,750	3,350	3,850	4,400	5,000	5,500
20"				3,350	4,050	4,700	5,500	6,000	6,500
22"				4,000	4,800	5,500	6,500	7,000	8,000
24"					5,500	6,500	7,500	8,500	9,500
26"					6,500	7,500	8,500	9,500	10,500
28"					7,500	8,500	10,000	11,000	12,500
30"					8,500	10,000	11,500	13,000	14,000
32"						11,000	13,000	14,500	16,000
34"						12,500	14,500	16,000	18,000
36"						14,000	16,000	18,000	20,000