Teacher	Dorothy Carter & Liz Schababerle	Course/Content	Human Anatomy & Math
Grade Level	9-12	Duration	2 weeks

Vision	Integrating math and science with local culture in the form of subsistence living.
Standards:	Big Ideas:
Math Standards G-GMD.4. Identify the shapes of two-dimensional cross-sections of three-dimensional objects, and identify three-dimensional objects generated by rotations of two-dimensional objects. G-MG.1. Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).* G-MG.2. Apply concepts of density based on area and volume in modeling situations (e.g., persons per square mile, BTUs per cubic foot). **Science Standards** [9] SC2.1-describing and comparing the characteristics of phyla/divisions from each kingdom [9-10] SC2.3- stating the function of major physiological systems (i.e., circulatory, excretory, digestive, respiratory, reproductive, nervous, immune, endocrine, musculoskeletal and integumentary. [11] SC2.1- describing the structure-function relationship **Cultural Standards** A.2: Utilize the Elders' expertise in multiple ways in their teaching A.3: Provide opportunities and time for students to learn in settings where local cultural knowledge and skills are naturally relevant B.1: Regularly engage students in appropriate projects and experiential learning activities in the surrounding environment B.3: Provide integrated learning activities organized around themes of local significance and across subject areas C.2: Exercise professional responsibilities in the context of local cultural traditions and expectations E.2: Provide learning opportunities that help students recognize the integrity of the knowledge they bring with them and use that knowledge as a springboard to new understandings E.3: Reinforce the student's sense of cultural identity and place in the world	-Anatomically relative positions of organs bones -Use of geometric modeling -Familiarity with relevant scientific and mathematical terminology -Ability to properly label body planes, quadrants and bones

Formative Assessments	Summative Assessment
● Exit slips -Metacognition ● Practice Quizzes ● Worksheets (Vocabulary, Formulas, …) ● Idea spinner: Identify, compare, and contrast the quadrant of the body the spinner lands on.	● **Science Assessment**: Multiple-choice exam with vocabulary and fill-in the blank diagram. **- 100pts possible** ● **Math Assessment**: Test on planes, volume, density, and angle calculations. **- 100pts possible**

Materials & Resources	Technology	Learning Activities
● AK Dept. of Fish & Game for dissectable dead fish ● Local mentor to interact with the students in a real-life application of the material	● Twitter posts: relate vocabulary and formulas to everyday life situations. Each relevant post = x points ● Socrative.com- as in class interactive way to track student learning via polls and practice questions	● Construct and label diagrams ● Word matching interactive game ● Density/volume: blown up balloon vs. water-filled balloon ● Dissection lab

Specific
Math Ninth grade math students will be able to demonstrate the use of geometric concepts of volume, density, planes, and distance between two points pertaining to human and animal anatomy. The purpose of this is to help them communicate in the context of their sustainable lifestyle. The animals we will be focusing on are fish and bears. **Science** Ninth grade students will be able to demonstrate the use of anatomic concepts such as: proper use of vocabulary, identifying location of planes, quadrants and organs, as well as the density and volume of organs before and after physiological changes. This knowledge will allow the students to apply contextual terms to everyday life (i.e. subsistence living).
Measureable
Math Students will be able to label and calculate above mentioned concepts. **Science** When students are able to appropriately locate/label planes, quadrants and organs. As well as define the structures' physiological function.
Attainable

Math & Science By the end of week 1, students will be able to properly define and apply relevant vocabulary and mathematical formulas. Throughout the unit plan students will participate in lectures, activities, and discussion that are in line with Alaska's cultural and content standards. By the end of the 2 week unit, students will be able to implement the knowledge gained from the unit to a subsistence lifestyle. Assessment will be given in the form of a multiple choice, fill-in-the-blank, and critical thinking unit exam.
Relevant
Math & Science This unit plan allows students to acknowledge the usefulness of this content matter in their subsistence lifestyle. Students will interact with a member of their community who is practicing a subsistence lifestyle.
Targeted
Math & Science Students will build on this knowledge in future units as well as further integrating the knowledge into their everyday life experiences.

	Day 1: Vocab & Correlation between math & anatomy		Day 2: Organ Systems & Quadrants		Day 3
Science	Word Wall match pix to words & Video		Powerpoint & socrative questionaire: planes and vocab		Show different placements for planes, describe quadrants, and where organs are relative to each plane
Math	Introduce Planes, have students label them, ask which planes are cut during fishing, hunting, etc		Construct a diagram showing planes and quadrants		Find the length of lines between points on a 3D plane
	Day 4		**Day 5: Week wrap-up**		**Day 6**
Science	Organ function and referred pain		Assessment: where they're at and what needs to be worked on		Review. Start prelab for disection
Math	Speed Calculations relative to organ functions and nerve impulses		Assessment: where they're at and what needs to be worked on. fun wrap up movie		Volume & density activity inflated lung vs deflated lung; stomach full vs empty
	Day 7		**Day 8**		**Day 9**
Science	Thoracic disection and volume calculations: swim bladder. Skeletal Structure & Density Calculations		Field trip: Math & Science classes will visit an elder's smoke house and watch him cut & weigh the fish. Students will be expected to use terms learned in class during the elder's demonstration		Review: Jeopardy
Math	Balloon toss density & volume activity				Review Game: split into groups & get students up and moving
	Day 10: Assessment:				
Science	Assessment: Multiple choice exam with vocabulary and fill-in the blank diagram				
Math	Assessment: Test on Planes, Volume, Density, & Angle calculations				

Student Name_____	Title- Creative Anatomy: Fictional Mammal				

Element	4	3	2	1	Student Score	Teacher Score
Use of Classtime	Used time well during each class period. Focused on getting the project done. Never distracted others.	Used time well during each class period. Usually focused on getting project done and never distracted others.	Used some of the time well during each class period. There was some focus on gettinng the profect done but occasionally distracted others.	Did not use class time to focus on the project OR often distracted others.		
Evaluator's comments:						
Graphics and Orginality	Several of the concepts used on the poster reflect a exceptional degree of student creativity in thier creation and/or display.	One or two of the concepts used on the poster reflect student creativity in thier creation and/or display.	The concepts are made by the student, but are based on the designs or ideas of others.	No concepts created by the student are included.		
Evaluator's Comments:						
Required Elements	This poster includes all required elements as well as additional information.	All required elements are on the poster.	All but 1 of the required elements are included on the poster.	Several required elements are missing.		
Evaluator's Comments:						
Grammar	There are no grammatical mistakes on the poster.	There are 1-3 gramatical mistakes on the poster.	There are 4-6 grammatical mistakes on the poster.	There are more than 6 grammatical mistakes on the poster.		
Evaluator's Comments:						
Labels	All organs and features are clearly labeled and can be read from 3 feet away.	Almost all organs and features on the poster are clearly labeled and can be read from 3 feet away.	Most organs and features on the poster are clearly labeled and are visible from 3 feet away.	Most organs and features are not clearly labeled and/or cannot be visible from 3 feet away.		
Evaluator's Comments:						
Self Reflection:						

Reference:
http://www.rubrics4teachers.com/pdf/GenericPosterRubric.pdf

Plantar Surface	Sole of foot
Frontal Plane	Coronal Plane
Caudal	Toward the tail
Ventral	Front
Dorsal	Back
Transverse Plane	Horizontal plane

Mid-sagittal plane	Midline
Proximal	Nearer to center
Distal	Further from center
Cranial	Toward the head
Medial	Midline
Lateral	Side

Anterior	Front
Posterior	Back
Superficial	External
Deep	Internal
Volume	Cubic units of space an object occupies
Density	Mass divided by volume

Plane	Longitudinal section through a 3D object
Point	Exact position on a plane
Distance	Amount of space between two points
Speed	Rate of motion
Impulse	Electrical signal