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Essential Questions and Unit Rationale

Essential Questions

- What is the value of life?
- How do people of all ages contribute to our community?
- How can we experience a "power with" life at any age?
- How and why do people grow older?
- Why is it important to respect all others and ourselves?

Unit Rationale

This unit, Full of Life, aims to show middle school students that all members of society have the potential to be worthy contributors to the community. Our theme will focus mainly on the elderly population to educate students about the aging process, to examine trends in demographics due to advances in technology and medicine, to study relevant characters and themes in literature, to uncover the familial and societal dynamics of other cultures, and to

garner an understanding and appreciation for all by learning about and working with elders from our community.

Middle school is a tumultuous time in almost all students' lives. Their bodies are changing, their minds and views are constantly expanding, and they are caught in limbo between the limits of childhood and the potential freedoms of adulthood. Egocentricity is at its highest, so it can sometimes be difficult for adolescents to see beyond themselves and their seemingly small place in the world. Thus, we believe it is important to create and facilitate an interdisciplinary unit of study that allows students to learn about and experience life from the perspective of another generation.

Our students should make connections between their lives, their limitations, and their potential and those same things in our elderly. Our society is not one that generally reveres its elderly nor does its adolescent population have much if any clout in decision-making, respect, or freedoms. Adults – post teenager and pre-retirement aged people – seem to hold the power in our culture. We want our students to discover ways in which they and the elderly can make valuable contributions to the community and develop a "power with" attitude toward all members of society regardless of their age. Ultimately, we want our students to foster a respect for all people through this unit. We want them to believe in the worth and dignity of every person – and especially in that of themselves.

Unit Overview, Goals, and Objectives

Unit Overview

This is designed to be a three-week interdisciplinary unit of study incorporating English, science, social studies, mathematics, and the unified arts into a focused learning project on the role and contributions of the elderly in our society. It is the teachers' hope that students will come appreciate that and all other age groups and people through hands-on, inquiry based learning activities. The unit includes a large service-learning component – the creation of a community garden – students will interact with members of the community to plan, grow, and dedicate a garden on the grounds of the school. In addition to the community garden as a service learning component, we will also be hosting a literary luncheon at the school. For several months leading up to the luncheon and garden dedication ceremony, students will exchange pen pal letters from elderly members of our town who live in a retirement community. The school will loan copies of *The Pigman* to these seniors to read at their leisure before the

literary luncheon where, once students have also read the book in their English class, they will meet and engage in a discussion about it with their pen pals.

Goals and Objectives

- Students will broaden their perspective about age groups both different and including their own.
- Students will, through inquiry-based learning, learn about the importance of respecting all people with a focus on the elderly.
- Students will complete hands-on, interactive tasks to become fully engaged in their learning.
- Students will make a connection between the context and circumstances of their own lives to that of the elderly.
- Students will learn about the concept of “power with” to better understand how all members of society can be positive contributors.
- Students will learn about the contributions and roles of elderly members of their own community as well as other cultures.

Habits of Mind

As we begin this unit, one of our main goals is to let the learning be driven by the students' questions. We want them to point the sails as we steer the ship, so to speak. Our students' inquiry is of the utmost importance as their learning is dependent upon their interest, their curiosities, and their desire to know more. Habits of mind are the critical and higher-level thinking skills we want our students to develop and foster continually through this unit. The main habits of mind we wish to explore in this unit are as follows.

Cooperating and Collaborating

Much of our unit will be done in groups, whether large or small, so the importance of our students to hone their cooperation skills is immeasurable. We want our students to see the value of a team oriented project and to feel the rewards of accomplishing something *together*, rather than alone. We want students to see how working with both their peers and adults toward a common goal enhances their learning. While some

activities and assessments will be completed individually, we want the feel of this entire unit to be one of unity and collaboration.

Thinking Fluently and Flexibly

As students learn about the body systems in science and the rates of living expectancy across a century, we want them to have their minds open to learn things they never have before. As they explore different cultures in social studies, they may need to relearn what they thought of other cultures around the world, so we want to encourage them to ask questions and gain new understandings through changing their perspectives on certain information.

Taking Risks

Sometimes students need to pursue their interests and their learning in ways they have never done before. Attempting to see the population as three separate units -- children, adults, and seniors – they will be embarking on a mission that asks them to change this and see all people as valuable and contributing members. We want them to see that this can be a "power with" society if certain measures are taken. To this end, our service learning project will provide much of their risk taking as they will be bridging the gap between themselves and much older adults as well as taking a major agricultural risk – growing a garden during a New England spring.

Searching for Patterns

Students will be looking both objectively and subjectively at their own culture, the culture of our community, our country, and other places in the world. Once they are able to see the way things work or the way they exist, they will be better equipped with the knowledge to suggest and

make changes for themselves and others. We want them to look for patterns in the way societies treat elderly people in literature and from an anthropological viewpoint in social studies as well. In math and science, we want them to see how medicine and our bodies follow patterns and have similarities.

Study Skills

Study Skills

Study-Skills will be taught and reinforced throughout the various activities of the *Full of Life* Interdisciplinary Unit. The following is a list of the specific study skills that the team will be actively incorporating into the activities planned within their respective disciplines.

Mathematics

1. Using research effectively
2. Organization skills
3. Cooperative learning
4. Effective Planning
5. Effective Listening
6. Time Management Skills
7. Problem Solving Skills

Social Studies

1. Critical Thinking

2. Various methods of research
3. Effective Listening
4. Analyzing
5. Teaching to others
6. Reflecting
7. Cooperative Learning
8. Forming Questions
9. Practicing and learning from Empathy

English Language Arts

1. Note Taking
2. Planning
3. Organization of Knowledge
4. Organization of Thoughts
5. Effective Communication
6. Goal Setting
7. Summarizing
8. Forming Questions
9. Collaborative Learning

Science

1. Keeping Records
2. Organization of data
3. Time Management
4. Making predictions
5. Drawing Conclusions
6. Asking questions
7. Critical thinking

Engaging Activity

Getting our students involved in, focused on, and excited about our project is extremely important to the success of our unit. Our students' curiosity and interest must drive what we do, so getting them engaged right from the start is our primary goal. One of the main ways in which we believe we can get students involved is to make a connection for them. We want them to see how similar their lives are to those of the elderly generation. We want them to become immersed in a unit that initially, we realize, will be of little interest to them. Aside from their grandparents, teenagers likely have little contact with or interest in the elderly population.

In order to make this possible, we want our engaging activity to help students make a connection between themselves and the elderly. In small groups, students will be asked to write down the following words: watch, car keys, store, and a dollar sign. Each group will be labeled as an age group (depending on how many groups there are): children, teenagers, 20-30 somethings, 40-50 somethings, and the retired or elderly population. They

should brainstorm what those four items mean to that age group. Each group will share and the class will be engaged in a discussion about each.

In their groups, students will be asked to make connections between the elderly age group and their age group. Their thinking should be guided toward considering the roles of those age groups, their freedoms – or lack their of, their dependence on others, and their ability to participate in society. This will lead into to a discussion about "power with" and "power over" and how the adults of our society hold the power and have the most independence and freedom to participate in society to the fullest.

Culminating Activity/Service Learning Component

The culminating activity will be held in the month of May or June, probably a few weeks to a month after the conclusion of the interdisciplinary unit. The gap in time between the end of our unit and the culminating activity is due to the nature of our service learning component – the community garden. We will be at the whim of Mother Nature as our students plant, nurture, and grow plants and flowers in the garden. Our team believes the garden dedication ceremony will be celebrated best if the weather is warmer and the garden is in full bloom. Our "Full of Life" theme will become a living, breathing event for our students and guests to enjoy.

The event planning aspect of our culminating activity will take more than the span of our three-week ITU as well. We will establish pen pals between our students and a local retirement community around the half-way point of the school year. We want this special relationship to have more time to develop before our students meet their "pals" at the Full of Life celebration. Also, we want to give our retirees plenty of time to read *The Pigman*. The school will, once

the pen pals have been established, loan a copy of the book to each of the elderly people involved and ask them to read it at their leisure before our celebration. The content of the pen pal letter exchanges may pertain to the reading of the novel but will likely be about general questions and topics generated by the students.

The community garden dedication is meant to be a symbolic representation of the constant growth and change of our community. A garden is "full of life" and that is the primary message we hope our students want to send to the seniors of our community. The planning, landscaping, and budgeting for this garden will take place mainly in science and math classes and will, again, be accomplished over the course of several months. We will need to elicit help from our administration, our maintenance staff, and our students' parents to facilitate the creation of our garden. We will need donations or perhaps a fundraiser in order to generate the necessary funds for purchasing tools, soil, seeds, plants, and flowers. Our maintenance staff will need to be aware of our project so they can help us as they are in control of the upkeep of our school grounds.

The Full of Life celebration will take place during the school day and will consist of a luncheon in our school's cafeteria. Seniors from the retirement community will be invited, through a formal invitation written in English class, to join us to discuss *The Pigman*, attend our garden dedication ceremony, and celebrate life with our students. Students will have a list of questions and discussion topics for the lunch as they are able to meet and share a table with their pen pal. After lunch, the students and the seniors will walk to the garden where our blooming finished product will be displayed and dedicated to all of the positive contributions people have made – and continue to make – to our community.

Content Area: English/Language Arts

Overview

The main objective of the English / Language Arts (ELA) component of this ITU will be to incorporate literature and writing into daily activities. Through a variety of texts, students will study the presentation and characterization of the elderly in literature. Poetry, short stories, films, and novels will be used to help students examine the portrayal of seniors in both classic and more contemporary pieces of literature.

One of the major components of this literary study will be the reading of Paul Zindel's *The Pigman*. A novel from the late 60s, *The Pigman* is often considered as one of the first young-adult novels – part of the dawning of this sub-genre. It is a genuine and often comical look at the surprising relationship between two teenage protagonists, John and Lorraine, and Mr. Angelo Pignati, a retired man whom they meet and befriend after crank phone calling him one evening. What follows is a wonderful relationship between the three and an inspiring theme about enjoying life, learning about oneself, and becoming whatever kind of person one wants to become. Much of the actual reading of the

novel will be done outside of class with class time focused on supplementary texts and activities.

Some of the supplementary activities will include poems by Alice Walker and Maya Angelou as well as short stories by Flannery O'Connor and Katherine Anne Porter. We will watch the film *Cocoon* and students will write a reflective piece on that experience. Excerpts from novels with themes similar to that of *The Pigman*, such as *Being with Henry* by Martha Brooks and *Tuesdays with Morrie* by Mitch Albom, will be incorporated into cooperative group learning activities to enhance and enrich the students' reading of the main text of the unit.

In addition to reading this variety of texts, students will participate in reflective writing exercises every day. They will journal in response to what they are reading, questions they have, or other comments or insights the literature may bring about for them. Quizzes will take place each week on Tuesdays and Fridays to check for reading comprehension and understanding of the unit concepts as a whole.

Another major supplementary activity that may run longer than the three-week ITU is a pen-pal program the ELA teacher will set up with a local nursing home or retirement community. As the service learning component of the community garden and literary luncheon will be requesting volunteers from a large retirement community (comprised of about 150 small homes in a 55+ village), the ELA teacher will likely use that as a resource for setting up the pen-pal program as well. Interested seniors from that community will be paired with a student on our team and letters will be exchanged on a weekly basis between the retirement community and the school. Students will participate in this for several months leading up to the unit so they develop more of an understanding and appreciation for the people with whom they will be interacting at the literary luncheon and community garden dedication ceremony.

Massachusetts English Language Arts Curriculum Frameworks

Language Strand

- 1.2 Follow agreed-upon rules for class discussion and carry out assigned roles in self-run small group discussions
- 2.3 Gather relevant information for a composition through interviews

Reading and Literature Strand

- 8.23 Use knowledge of genre characteristics to analyze a text
- 8.30 Identify and interpret themes and give examples from the text
- 11.1 Relate themes in works of fiction and nonfiction to personal experience
- 11.4 Analyze and evaluate similar themes cross a variety of selections, distinguishing theme from topic.

Composition Strand

- 19.11 Write brief summaries of information gathered through research
- 19.22 Write and justify a personal interpretation of a literary, informational, or expository reading that includes a topic statement, supporting details from the literature, and a conclusion.
- 23.11 Organize ideas for writing comparison/contrast essays
- 24.6 Formulate open-ended research questions to explore a topic of interest or design and carry out research

Breakdown of Lessons over a Three-Week Span

Week One
Lesson One

- Distribute copies of *The Pigman* and lead a discussion about the basic elements of the book.
- Students will brainstorm characteristics of old people based upon their personal family lives, movies and television shows they have seen, or books they have read.

- Students will journal on how they feel about elderly people, what stereotypes they have seen, and what role they believe they play in society.
- At home: Read "The Oath" and chapter 1 of *The Pigman*

Lesson Two Quiz on *The Pigman*

- Discussion of previous night's reading within groups and whole-class
- The class will visit the school's library/computer resource area. Students must find a poem or a short story about an older person. Students should copy, print, and read and summarize their selections.
- At home: Read chapter 2 of *The Pigman*

Lesson Three

- Discussion of previous night's reading within groups and whole-class
- In their groups, students will take turns sharing the story/poem they read yesterday.
- Students will participate in a jigsaw activity using newspaper articles about the plight of the elderly during this economic crisis.
- Students will write a R.A.F.T. (role, author, format, task) from the viewpoint of an elderly person writing to a family member.
- At home: Read chapter 3 of *The Pigman*

Lesson Four

- Discussion of previous night's reading within groups and whole-class
- In groups, students will write characterizations of John and Lorraine's mothers – two very different women in the novel. Groups will generate discussion questions based on the qualities of parents, parenting roles, and gender roles in families.
- At home: Read chapter 4 of *The Pigman*

Lesson Five Quiz on *The Pigman*

- Discussion of previous night's reading within groups and whole-class
- ESR Activity: Power Over vs. Power With
- Journal reflection
- At home: Read chapters 5-6 of *The Pigman*

Week Two

Lesson Six

- Discussion of previous night's reading within groups and whole-class
- Four examples of children's literature in which there are intergenerational relationships will be shared.

- Students will complete this as a jigsaw activity and will look for visual representations of the older characters and look for what these characters do and say in each of the texts.
- At home: Read chapter 7 of *The Pigman*

Lesson Seven Quiz on *The Pigman*

- Discussion of previous night's reading within groups and whole-class
- Students will visit a local nursing home. The nursing home has arranged for the cafeteria to be used for meetings with some of their residents.
- Students will come equipped with questions for the person they will interview.
- At home: Read chapter 8-9 of *The Pigman*

Lesson Eight

- Discussion of previous night's reading within groups and whole-class
- Students will participate in Mix-Freeze-Share and discuss what they learned from their experience at the nursing home.
- Students will read Alice Walker's poem "Lineage" and discuss how the grandmothers are portrayed in that poem in contrast with the stereotypical image we have of a grandmother. A journal prompt will follow.
- At home: Read chapter 10 of *The Pigman*

Lesson Nine

- Students will read excerpts from either *Tuesdays with Morrie* or *Being with Henry*. They will complete a writing assignment comparing and contrasting the intergenerational relationships in those texts to that of Lorraine and John's in *The Pigman*.
- At home: Read chapters 11 of *The Pigman*

Lesson Ten Quiz on *The Pigman*

- Discussion of previous night's reading within groups and whole-class
- Students will participate in inside outside circle and ask one another the questions they generated during the video. They will also discuss the questions within their base groups.

Week Three
Lesson Eleven

- Discussion of previous night's reading within groups and whole-class
- Each group will be giving copies of "The Jilting of Granny Weatherall" and "A Good Man Is Hard to Find". Students will read one of the stories in pairs

- In a Think-Pair-Square format, students will discuss the story they read with their partner and share the basic plot and theme with the other pair in their group.
- At home: Read chapters 12-13 of *The Pigman*

Lesson Twelve Quiz on *The Pigman*

- Discussion of previous night's reading within groups and whole-class
- In groups, students will create discussion questions based on what they have read thus far in *The Pigman*. They will generate their own topics of discussion with the Literary Luncheon in mind. These questions will be shared in a whole-class format, and the class will choose which are best for the day of the culminating activity. These will be saved and printed for students that day later in the spring.
- At home: Read chapters 14 of *The Pigman*

Lesson Thirteen

- Discussion of previous night's reading within groups and whole-class
- Begin watching *Cocoon*.
- Students will be asked to record any questions that come to mind while they watch the film.
- At home: Read to the end of *The Pigman*

Lesson Fourteen

- Students will participate in an Inside Outside Circle and ask one another the questions they generated during the video. They will also discuss the questions within their base groups.
- Finish watching *Cocoon*. Students will write a response to the movie in their journals by writing about what they would do if they found a fountain of youth and what the movie's message is about being young at heart regardless of age.

Lesson Fifteen Essay test on *The Pigman*.

Content Area: Mathematics

Overview

Celebrating the worth and dignity of every person with a focus on the elderly population. Students will do research on the effects on the economy due to the rejoining of the elder population. They will also take a look at life expectancy over the past ten decades. They will look at trends, and how mathematicians calculate life expectancy.

Instructional Objectives:

Students will use ratios and proportions to compare, order, estimate, and translate information on life expectancy. They then will be able to make line, pie, and bar graphs to show their findings. Students will be able to use their findings, and graphs to interpret the trends, and influences in life expectancy. Students will use mean, median, and mode to determine what the effect t of the elderly population is when they rejoin the current work force. Students will also develop

survey's and interview the elderly population in there towns in order to come up with more accurate ratio's and proportions to be able to graph information found.

Study Skills:

8. Using research effectively
9. Organization skills
10. Cooperative learning
11. Plain effectively
12. Effective Listening
13. Time Management Skills
14. Problem Solving Skills

Massachusetts Frameworks:

- **7.N.1** Compare, order, estimate, and translate among integers, fractions and mixed numbers (i.e., rational numbers), decimals, and percents.
- **7.N.2** Use ratios and proportions in the solution of problems involving unit rates, scale drawings, and reading of maps.
- **7.P.1** Extend, represent, analyze, and generalize a variety of patterns with tables, graphs, words, and, when possible, symbolic expressions. Include arithmetic and geometric progressions, e.g., compounding.
- **7.P.3** Create and use symbolic expressions for linear relationships and relate them to verbal, tabular, and graphical representations.
- **7.P.4** Solve linear equations using tables, graphs, models, and algebraic methods.
- **7.G.4** Graph points and identify coordinates of points on the Cartesian coordinate plane (all four quadrants).[2]
- **7.G.5** Use a ruler, protractor, and compass to draw polygons and circles.

- **7.D.1** Select, create, interpret, and utilize the following tabular and graphical representations of data: circle graphs, Venn diagrams, stem-and-leaf plots, tables, and charts.

- **7.D.2** Find, describe, and interpret appropriate measures of central tendency (mean, median, and mode) and spread (range) that represent a set of data. Use these notions to compare different sets of data.
  This standard is intentionally the same as standard 8.D.3.

- **7.D.3** Use tree diagrams, tables, organized lists, and area models to compute probabilities for simple compound events, e.g., multiple coin tosses or rolls of number cubes.

Weekly Math Activities

Week One

Goals: Students will begin to think of different survey questions, and different strategies for doing research on the given topic. Students will be introduced to ratios and size change of our elderly group. The concepts of ratios and proportions will be introduced to the students through the surveys created to take a look at our elderly population. Students will also use survey monkey. We will brain storm as a class different questions students could ask our elderly population. We will do examples and warm-ups using ratio's to practice the concepts during the week.

Day One: Today the concept of ratios and proportions will be introduced by doing an activity called comparison of ratios found in *Teaching Student-Centered Mathematics.* We will also discuss Surveys. Students will be asked to go home

and brain storm questions they could use to ask not only the elderly but also themselves. This is a continuation of the engaging activity.

Day Two: We will continue to talk about Ratios and Proportions and how surveys can be used in this topic. Today we will Brain storm questions that students came up with for homework. Together we will decide on a final survey that students will take themselves. They will also for homework interview a parent and an elderly person.

Day Three: Today we will use the cow (computer on wheels) to use Survey Monkey. Students will create the survey they had used the night before to interview their parents, and elderly.

Day Four : Students get into groups of four and compile the result of the three surveys. They will then make a large chart to show the class there results. The students will then come back together as a class and discuss their findings. We will start talking about ways they can use this information in finding ratios and proportions. For homework students will take there groups findings and complete ratios for their findings

Day Five: Today we will start by discussing the ratios that students came up with, with there survey findings. This will lead to talking about ways to graph these findings. We will talk about the different types of graphs and what each would be good for. Students will take this information home of the weekend and work on three different types of graphs using a work sheet with information.

Week Two

Goals: Students will be introduced to graphing. We will take a look at bar, circle, and line graphs. How to label the graphs and how to figure out where the data should go. Students will be broken up into groups to brain storm Title idea's for their graphs. They will then do practice problems using mean, median, and mode, as well as continuing to use ratio's and

proportions. Students will also start surveying members of the community for homework. They will be able to use survey monkey or interview those elderly person in the community in person.

Day One: In their groups students will share the graphs they created with each other. They will discuss what things they thought were easy, or hard, take a look at how it was labeled. Then we will come together as a group and share our findings. Then we will discuss each type of graph and how they should be labeled.

Day Two: Today we will do an Activity called "Different Units, Equal Ratios" *Teaching Student-Centered Mathematics.* Students will take home anything unfinished to complete it.

Day Three: Today we are going to start to talk about the connection between ratio's, proportions, graphing and measurements. Measurement will be introduced to students by working in groups on a project where you take yarn and measure the length of your arms and legs and it turns out to be your height. Students usually love this activity. Students will be asked to go home and measure things around the house and bring them in the next day.

Day Four: Today we will take the items that students decided to measure for homework and create a chart together as a class. Then students will break up into groups and decide the best way to represent this information in a graph. The students can pick and choose what measurement information found they want to use in the graph. For homework students will brain storm how all of there findings so far can tie into the community garden we will be creating with our elderly community.

Day Five: Today we will take a walk to the area where we will be creating the garden with the elderly community. Before we head down to the garden area we will discuss as a class the brainstorming they did for homework. Then we will bring our measuring tapes, yard sticks, paper, and pens with them. The students

will measure the area and decide together what they find and come to a discussion together on how big this garden will be. For homework students will be asked to bring in hardware store ads if they get a newspaper over the weekend.

Week Three

Goals: After measuring for the garden students will discussion what supplies they will need and determine how much of everything they will need. Students will look through the flyers in class to determine the cost of supplies for the garden**.** Students will be taking all of the information they have learned, and compiled over the last two weeks to create their final project which is a graph on the cost for the garden and a scale drawing of what the garden will look like. They will use the rubrics for their final graphs, and problem solving techniques to create their final project. Students will be given class time to work with-in their groups to do this. We will also use class time to complete presentations as well. This will run into another week to do the presentation and to finish the final graph and scale drawings.

Day One: Today we will talk about how much of each supply we will need. Then students will work in their groups using the flyers to come up with a cost for each supply. They will create a chart that they will share with the class. We will come to a consensus as class as to how much money we will need for each item and how much of the item we will need.

Day Two: Students will work in their groups on creating a rough draft of the graph they have chosen to use to present the information. For homework students will be asked to look at their rooms, write down what is in their room, and to measure the furniture.

Day Three: Today we will go over how to do a scale drawing on graph paper. For practice students will draw their rooms on graph paper this information they should have written down for homework the night before.

Day Four: Today students will work in their groups to come up with a scale drawing of the community garden.

Day Five: Students will be given class time to finish up their final graphs and scale drawings and to get their presentations ready to present on Monday.

Assessment:

Assessment in math will be on-going.

- Students have nightly homework, which will be checked daily.
- Students will also keep a track of their survey's they have created on surveymonkey.com
- Students will be working towards their final project of compiling all of the information they have found by doing calculations, and graphing the information.
- The final project will be a presentation of their findings and graphs they have created

Example of graph:

Content Area: Science

Overview

Students of all ages, but particularly those of middle school age, have a natural curiosity about their bodies and how they work. Human Body Systems taps this curiosity by helping students clarify what they already know about their bodies and giving them an opportunity to perform a series of engaging hands-on activities through which they extend and enrich this knowledge. Each lesson builds on skills and concepts presented in previous lessons. As students progress through the module, they take greater responsibility for their own learning, eventually planning and conducting their own procedures, devising their own data tables, and analyzing the results they obtain. Therefore, the module should be taught as a complete unit. It should not be used as a sourcebook of occasional experiments. Human Body Systems is divided into three parts: The Digestive System, The Respiratory and Circulatory Systems, and the Musculoskeletal System.

Once students understand the operations of these systems they can understand why participating in aerobic exercise at least three times a week for a half hour each time, and eating a low fat limited calorie diet will assist them as teenagers in both heath and beauty aspirations, while leading to senior citizens living a happier and healthier life in their old age. These skills will be used in creating both podcasts and brief video clips aimed at both teens and the elderly about the utility of engaging in appropriate exercise and eating.

Massachusetts Frameworks

Life Science

- 2. Recognize that all organisms are composed of cells and that many organisms are single-celled (unicellular), e.g., bacteria, yeast. In these single-celled organisms, one cell must carry out all of the basic functions of life.

- 3. Compare and contrast plant and animal cells, including major organelles (cell membrane, cell wall, nucleus, cytoplasm, chloroplasts, mitochondria, vacuoles).

- 4. Recognize that within cells, many of the basic functions of organisms (e.g., extracting energy from food and getting rid of waste) are carried out. The way in which cells function is similar in all living organisms.

- 5. Describe the hierachial organization of multicellular organisms from cells to tissues to organs to systems to organisms.

- 6. Identify the general functions of the major systems of the human body (digestion, respiration, reproduction, circulation, excretion, protection from disease, and movement, control, and coordination) and describe ways that these systems interact with each other.

(Part 1 is to be done by the students prior to beginning the ITU.)

PART 1. THE DIGESTIVE SYSTEM

Lesson 1 is a pre-assessment for the module. It gives students an opportunity to share what they already know about human body systems and the organs of which they are composed. Students begin constructing a human body systems poster that they will revisit and revise in subsequent lessons. On the basis of their current knowledge, students construct definitions of "organ" and "body system."

Lesson 2 serves as an introduction to the digestive system. Students measure and mark the length of the organs of the digestive tract on a long piece of polyvinyl tubing. Working in groups of for, they then simulate peristalsis by taking turns squeezing an oiled tennis ball through the tubing. (The tennis ball represents food traveling through the digestive tract.)

In Lesson 3, students use Benedict's solution and Lugol solution to perform chemical tests for sugar and starch, an activity that prepares them for exploring chemical digestion in the mouth.

Lessons 4 through 7 cover in detail the digestive processes that occur in the mouth, stomach, and intestines. During this sequence of lessons, students explore the digestion of carbohydrates, proteins, and fats and examine how the structure of the inner layer of the small intestine facilitates the absorption of digested nutrients into the bloodstream. Students also explore two mechanisms of absorption-diffusion and active transport. Lesson 4 marks the beginning of a "weaning" process that moves students from a point where they are provided

with all the components of a scientific inquiry to one where they must design part or all of an inquiry themselves.

Lesson 8, The first of three formal assessments, has two parts. The first part is a performance assessment in which students are presented with a problem that involves chemical testing of foods and are charged to design and conduct an inquiry to solve it. Working in pairs, students choose their materials, design a procedure and data table, conduct the inquiry, record their results, and state their conclusions. In the second part of the assessment, students work individually to complete a series of selected-response item, many of which involve analyzing illustrations of processes or concepts introduced in Lessons 1 I through 7. Students also update and revise their human body systems posters.

(Part 2 begins the activities and concepts for the ITU.)

PART 2 THE RESPIRATORY AND CIRCULATORY SYSTEMS

Lesson 9 introduces the Human Body Systems Anchor Activity, which is entitled Diseases and Health Careers. The Anchor Activity is a research project during which students work in pairs to gather information about a disease or health care career, organize their findings, and display them in poster form. When their work is complete, each pair shares its poster with the class in a brief oral presentation. Students are encouraged to use a variety of print, audiovisual, and on-line resources to research the topic they have selected for their Anchor Activity. By this point in the module, students have become familiar with the processes of digestion. They are aware that digested nutrients pass through the walls of the small intestine into the bloodstream, which transports them to body cells.

Lessons 10 and 11 Students explore how their bodies obtain another substance needed by the cells-oxygen. They explore the mechanisms of breathing and gas exchange as well as the capacity of the lungs to hold large quantities of air. The logical next step is to explore what happens to oxygen and digested nutrients when they reach the body cells.

Lesson 12 Thus, students explore cellular respiration, the process whereby oxygen reacts with nutrients to release energy for life activities. First, students explore combustion by observing the burning of a candle. This experience familiarizes them with the raw materials and end products of oxidation. Students then perform a series of short inquiries during which they examine the raw materials and waste products of cellular respiration. When these investigations are complete, students compare and contrast the processes of combustion and cellular respiration.

Lesson 13 Students explore the nature of calories by comparing the relative amounts of heat released by two different foods-marshmallows (representing carbohydrates) and walnuts (representing proteins and fats). This inquiry vividly illustrates the energy potential in various foods.

Lessons 14 through 16 concern the heart and the circulatory system. These lessons focus on how oxygen and nutrients are transported to the body cells and how wastes are carried away for eventual elimination.

Lesson 14 Students use a siphon-pump to explore the double-pump action of the heart.

Lesson 15. Heart rate and the factors that affect it are investigated.

Lesson 16. Narrowed arteries and the burden they place on the heart are investigated.

Lesson 17 is the second formal assessment in the module. It concerns the respiratory and circulatory systems. In the first part of this assessment, students design and carry out an inquiry that explores the effect of exercise on breathing rate. In the second part, they respond to a series of selected-response items and put the finishing touches on their human body systems posters.

PART 3 THE MUSCULOSKELETAL SYSTEM Part 3 of Human Body Systems, The Musculoskeletal System, deals with how the body uses the energy released by cellular respiration.

Lesson 18, during which students dissect a chicken wing, serves as an overview of the musculoskeletal system.

Lesson 19 Students explore the nature of joints, with an emphasis on how muscles, bone, and nerves work together to produce movement.

Lesson 20 Students examine the relationship between muscle size and strength.

Lesson 21 They focus on muscle fatigue.

Lesson 22 In the culminating inquiry students investigate homeostasis as they try to maintain a small quantity of water at average human body temperature for a short period of time. Following Lesson 22, students have two or three periods to practice their anchor activity and to present it to the class. They can also use this time to study for their final assessment.

Lesson 23 is a comprehensive, two-part module assessment. In the first part, students design and carry out an inquiry to determine how practice affects their reaction time to a visual stimulus. The second part contains selected-re response questions that cover the entire module.

Content Area: Social Studies

Overview

Within every culture and throughout history, the roles and social expectations of every demographic have never ceased to evolve. This is particularly true in terms of age. There was a time, right here in Massachusetts, when the daily life of the average twelve year old consisted almost entirely of working in factories to help support their families. In contrast, at many points in history, elder members of society have been revered for their wisdom and served as respected leaders in their family and often for their entire village or tribe. These are two extremes that few Middle School students in the United States are likely to relate to. From the perspective of Social Studies, this interdisciplinary unit will essentially be an inquiry into the diverse roles that elder members of society have held across a wide spectrum of settings as dictated by the geography curriculum.

Students will examine how people of all ages can contribute to the good of society and how elder members in particular, possess a certain worth and dignity that far exceeds the values in which the nuclear family structure of modern American culture typically appreciates.

Massachusetts Frameworks

- Describe the general level of education in selected countries in Africa and its relationship to the economy. (G, H, E)
- Describe the political and social status of women in selected countries in Africa. (G, H, E)
- Describe major ethnic and religious groups in various countries in Africa. (G, H, E)
- Describe the major obstacles to economic development in many African nations, including linguistic, tribal, and religious diversity; corrupt

government; the lack of widespread education; and the political boundaries established in the 19th century by European nations and the legacy of their rule. (G, H, C, E)

- Describe the general level of education in selected countries in Western Asia and its relationship to the economy. (G, H, E)

- Describe the political and social status of women in selected countries in Western Asia.
  (G, H, E)

- Describe major ethnic and religious groups in various countries in Western Asia. (G, H, E)

- Explain why the Indian government seeks to control population growth and the methods it uses to control population growth. (H, G)

- Describe the political, cultural, and religious differences between the countries in South Asia and the Central Asian Republics. (H, C)

- Describe the general level of education in selected countries in Central and South Asia and its relationship to the economy. (G, H, E)

- Describe the political and social status of women in selected countries in Central and South Asia. (G, H, E)

- Describe the general level of education in selected countries in East Asia and its relationship to the economy. (G, H, E)

- Describe the political and social status of women in selected countries in East Asia. (G, H, E)

- Describe major ethnic and religious groups in various countries in East Asia. (G, H, E)

- Explain how location has made the Korean peninsula both a battleground and a cultural bridge between China and Japan. (G, H)

Scope and Sequence

There are nine social studies activities designed specifically to enhance the geography

curriculum through an interdisciplinary bond that is focused on inquiry, community, and service learning.

The following activities will require anywhere from one day, to several weeks to complete.

Activity 1

The social studies component of this unit begins with a group brainstorming activity. Each group of four will be given a different card containing a descriptive quote that an older person has made about their daily life (the students will not be told that the quotes come from older people). They will then be instructed to brainstorm with their groups to determine if the quote came from a middle school student, a parent, or a grandparent and to discuss what time period and culture that they may have lived in. Each group will then share their quotes and report back to the class about their decisions. The quotes chosen will not seem like quotes from older people because they will not represent the characteristics and lifestyles of most of the older people that the students are familiar with.

Africa

As the unit begins, students will be exploring the roles held by elder members of society in various countries on the continent of Africa. After learning about several countries and the various ethnic and religious groups that populate them, students will choose within their small groups, one cultural group to analyze. Once they have come to a decision that every member of the group can agree upon, they will begin researching the roles that elder men and women have played within that group. The following is a list of countries that each group may choose from: (no two groups may choose the same country and country selection is first come, first serve)

> Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mayotte (Fr.), Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan, Swaziland, Tanzania, Togo, Tunisia, Uganda, Western Sahara, Zambia, and Zimbabwe.

Activity Two

Upon completion of their research, each group will share their knowledge by creating a multi-media presentation that illustrates their findings and reflects the creativity of each member.

ITU Activity Three

Students will collaborate within their small groups to develop a list of questions to be used during interviews that they will be conducting at a local retirement community. Upon completion of these interviews, each student will write a short reflective essay in response to their findings.

The Social Studies component of this ITU will take a short break and focus on other aspects of the geography curriculum while the other disciplines spend more time preparing for various activities.

Central and South Asia

The next unit that students will begin to investigate relative to this interdisciplinary unit is Central and South Asia. This includes: Afghanistan, Bangladesh, Bhutan, India, Kazakhstan, Kyrgyzstan, Nepal, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.

ITU Activity Four

Students will now work within their small groups to choose one *religious* group from Central or South Asia and conduct research into the economic and social expectations of elders within that culture. They will work collaboratively to gain an understanding of the impact that religion plays in the daily life of the population that they are investigating and will create a lesson that they will then teach to one of the other groups in the class. One requirement of this activity is that each group must administer an assessment to the group that they have "taught." Ultimately, each group's grade will be dependent on the performance of the group that they have assessed.

The Middle East

Students will now begin their inquiry into the geography of the Middle East, which encompasses:

> Armenia, Azerbaijan, Bahrain, Cyprus, Georgia, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, area governed by the Palestinian Authority, Qatar, Saudi Arabia, Syria, Turkey, United Arab Emirates, and Yemen.

ITU Activity Five

As the students begin to explore Middle Eastern Culture, they will collaborate to conduct research into the conflict and turbulence of this region. They will investigate and discusss the ways in which war (civil and otherwise) has particularly impacted the senior population in the Middle East. In addition, they will examine several primary source documents that reflect the unique perspectives of citizens at various stages of life.

ITU Activity Six

Students will be challenged to use their imaginations and creative writing abilities to figuratively step into the shoes of a particular member of Middle Eastern Society. They will craft diary entries that depict the feelings surrounding the particular life circumstances of the individual whose role they have assumed. Students will be randomly assigned an age category to work on and will have one week to conduct additional research and complete to activity.

ITU Activity Seven

Upon completion of activity six, students will either be given the opportunity to read their diary entries to the class or within their small groups (at the discretion of the instructor). Each small group will then discuss the diary entries and further explore the ideas represented by their peers that they may not have considered previously.

North and East Asia

The next unit of investigation will be of North and East Asia. Students will explore China, Japan, Mongolia, North Korea, Russia, and South Korea. As students delve into the cultures of North and East Asia, they will begin to wrap up their investigation of aging populations around the globe. At this point, they will begin culminating their knowledge in preparation for activities eight and nine.

ITU Activity Eight

Each social studies class will now work together as a large group, to create and publish a newspaper depicting the lives of senior citizens across the globe. This newspaper will include, but will not be limited to: editorials, advertisements, inspirational quotes or proverbs from particular cultures etc.

ITU Activity Nine

Finally, each group will write and produce a play, depicting their vision for how they would like to contribute to their families and communities when they reach senior citizen status. They will use their knowledge of African, West Asian, Middle Eastern, and Northern and Eastern Asian Culture and the information gathered during their senior citizen interviews to guide them in this creative and collaborative endeavor. In addition, a key component of each play will be how economic factors will have to support the vision they will be portraying. Each play will include direct references to the various cultural implications associated with elders and the science of aging and how they differ throughout the globe.

Content Area: Unified Arts

The role of unified arts in our interdisciplinary unit will be less involved than our content areas will be, but we would like to incorporate them as much as possible as the unified arts are an important part of the students' day. Also, we believe that researching musicians, artists, athletes, and actors who made significant accomplishments after the age of 50 will be a great additional component to this project. We will also incorporate this research into our culminating activity.

The music classes would research the popular music of the last century, decade by decade. Different styles of music, bands, dancing, and entertainment will be explored and presented in a variety of ways. As the culminating activity nears, students will use the information from their exchanges with their pen pals to determine which type of music was popular when those people were teenagers. This type of music will be researched and compiled to be played as background music at the literary luncheon portion of our culminating activity.

The art and computer technology classes would conduct research to find successful people that are over 50. Specifically, we want students to research people who have made contributions to the arts later in their lives. We want them to tie the unified arts to our Full of Life theme by showing students relevant, real examples of people who continue to life a fulfilling and make valuable contributions to society despite being past their "prime" years. Students will create posters and make biography books about the person whom they have researched.

Index of Resources and Rubrics

Resources Used in English/Language Arts:

Novel to be used as a focal point for unit:

The Pigman by Paul Zindel

Novels to be excerpted for comparison/contrast:

Tuesdays With Morrie by Mitch Albom

Being With Henry by Martha Brooks

Short Stories:

"The Jilting of Granny Weatherall" by Katherine Anne Porter

"A Good Man is Hard to Find" by Flannery O'Connor

Poem:

"Lineage" by Alice Walker

Books for children's literature lesson:

In Grammy's House by Eve Rice

Waiting for Noah by Shulamith Levey Oppenheim

Thundercake by Patricia Polacco

Bigmama's by Donald Crews

Film:

Cocoon, 1987, 20th Century Fox

ITU Math Rubrics – Final Project

Students will be graded on the following rubric.

Teacher Name: **Ms. Mays**

Student Name: _____

CATEGORY	4	3	2	1
Neatness and Attractiveness	Exceptionally well designed, neat, and attractive. Colors that go well together are used to make the graph more readable. A ruler and graph paper (or graphing computer program) are used.	Neat and relatively attractive. A ruler and graph paper (or graphing computer program) are used to make the graph more readable.	Lines are neatly drawn but the graph appears quite plain.	Appears messy and "thrown together" in a hurry. Lines are visibly crooked.
Data Table	Data in the table is well organized, accurate, and easy to read.	Data in the table is organized, accurate, and easy to read.	Data in the table is accurate and easy to read.	Data in the table is not accurate and/or cannot be read.
Accuracy of Plot	All points are plotted correctly and are easy to see. A ruler is used to neatly connect the points or make the bars, if not using a computerized graphing program.	All points are plotted correctly and are easy to see.	All points are plotted correctly.	Points are not plotted correctly OR extra points were included.
Type of Graph Chosen	Graph fits the data well and makes it easy to interpret.	Graph is adequate and does not distort the data, but interpretation of the data is somewhat difficult.	Graph distorts the data somewhat and interpretation of the data is somewhat difficult.	Graph seriously distorts the data making interpretation almost impossible.
Title	Title is creative and clearly relates to the problem being graphed (includes dependent and independent variable). It is printed at the top of	Title clearly relates to the problem being graphed (includes dependent and independent variable) and is printed at the top of the graph.	A title is present at the top of the graph.	A title is not present.

	the graph.			
Labeling of X axis	The X axis has a clear, neat label that describes the units used for the independent variable (e.g, days, months, participants' names).	The X axis has a clear label that describes the units used for the independent variable.	The X axis has a label.	The X axis is not labeled.
Labeling of Y axis	The Y axis has a clear, neat label that describes the units and the dependent variable (e.g, % of dogfood eaten; degree of satisfaction).	The Y axis has a clear label that describes the units and the dependent variable (e.g, % of dogfood eaten; degree of satisfaction).	The Y axis has a label.	The Y axis is not labeled.

Student Name: _____

CATEGORY	**4**	**3**	**2**	**1**
Mathematical Concepts	Explanation shows complete understanding of the mathematical concepts used to solve the problem(s).	Explanation shows substantial understanding of the mathematical concepts used to solve the problem(s).	Explanation shows some understanding of the mathematical concepts needed to solve the problem(s).	Explanation shows very limited understanding of the underlying concepts needed to solve the problem(s) OR is not written.
Mathematical Reasoning	Uses complex and refined mathematical reasoning.	Uses effective mathematical reasoning	Some evidence of mathematical reasoning.	Little evidence of mathematical reasoning.
Working with Others	Student was an engaged partner, listening to suggestions of others and working cooperatively throughout lesson.	Student was an engaged partner but had trouble listening to others and / or working cooperatively.	Student cooperated with others, but needed prompting to stay on-task.	Student did not work effectively with others.

Explanation	Explanation is detailed and clear.	Explanation is clear.	Explanation is a little difficult to understand, but includes critical components.	Explanation is difficult to understand and is missing several components OR was not included.
Checking	The work has been checked by two classmates and all appropriate corrections made.	The work has been checked by one classmate and all appropriate corrections made.	Work has been checked by one classmate but some corrections were not made.	Work was not checked by classmate OR no corrections were made based on feedback.
Neatness and Organization	The work is presented in a neat, clear, organized fashion that is easy to read.	The work is presented in a neat and organized fashion that is usually easy to read.	The work is presented in an organized fashion but may be hard to read at times.	The work appears sloppy and unorganized. It is hard to know what information goes together.
Diagrams and Sketches	Diagrams and/or sketches are clear and greatly add to the reader's understanding of the procedure(s).	Diagrams and/or sketches are clear and easy to understand.	Diagrams and/or sketches are somewhat difficult to understand.	Diagrams and/or sketches are difficult to understand or are not used.
Mathematical Terminology and Notation	Correct terminology and notation are always used, making it easy to understand what was done.	Correct terminology and notation are usually used, making it fairly easy to understand what was done.	Correct terminology and notation are used, but it is sometimes not easy to understand what was done.	There is little use, or a lot of inappropriate use, of terminology and notation.
Strategy/Procedures	Typically, uses an efficient and effective strategy to solve the problem(s).	Typically, uses an effective strategy to solve the problem(s).	Sometimes uses an effective strategy to solve problems, but does not do it consistently.	Rarely uses an effective strategy to solve problems.

Instructional Resources:

http://www.studygs.net/

http://www.surveymonkey.com

http://rubistar.4teachers.org/

http://www.classzone.com/cz/books/pre_alg/book_home.htm?state=MA

Van de Walle, J. A., & Lovin, L. H. (2006). *Teaching Student-Centered*

Mathematics. Boston: Pearson.