



General Education Assessment System

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West Virginia State University General Education Assessment System

I. Introduction

The General Education competencies for West Virginia State University were adopted in spring 2015. Both the General Education Committee and the Faculty Senate endorsed the Core Graduation Competencies.

In Fall 2015, the General Education instituted a General Education Assessment Committee comprised of Barbara Ladner, Tom Guetzloff, Jeff Pietruszyski, Debbie Williams, Jenn Zuccaro and Brenda Wilson. The committee held one meeting each semester during the 2015-2016 academic year. They decided to pilot some AACU VALUE rubrics in the Spring of 2016, and they collected the data from two of the AACU VALUE rubrics (Written Communication and Teamwork). The report from the professor who piloted the AACU VALUE rubric for Written Communication showed that the Written Communication VALUE rubric scores for an English 101 class were comprised mainly of Emerging scores, which is appropriate for an English 101 class. The professor did not report any difficulty in using the rubric for typical Freshman essays. The report from the professor who piloted AACU Teamwork VALUE rubric showed that she was unable to adequately score one of the elements, so she made the recommendation that that element be optional. The Assessment Committee also recommended that the General Education Committee adopt their proposed General Education Assessment Plan (See April 6, 2016 minutes). These were not adopted, because the General Education Committee wanted to get more faculty input into the plan. This resulted in the idea of encouraging faculty input through work sessions of faculty member who are currently involved in teaching General Education courses.

In Fall 2016, through the efforts of the Provost and the Deans Council, the University instituted work sessions for faculty members who teach General Education courses during which they selected rubrics for evaluation of general education competencies and suggested sample assignments that would be suitable for demonstrating general education competencies. The Provost and the Deans supported these work sessions and the Director of Institutional Research reported the results of the work sessions to the Provost and Deans.

Work Sessions: Except for the Quantitative Literacy group, each work session lasted approximately three hours. During that time, the leaders offered guidance by providing example rubrics for discussion. Example rubrics were sent electronically prior to each workshop. The Provost provided resources for each workshop. The list below includes the attendees at each work session from their area of expertise. Each work session was led by Vicky Morris-Dueer, the Director of Institutional Research, or Brenda Wilson, the Assessment Coordinator for the Department of Education, or both.

Work session date(s)	Content area	Attendees
6-Oct-16	Scientific Reasoning	Kathy Harper
3-Nov-16		Andy Schedl
		Ernest Sekabunga

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7-Oct-16	Written Communication	Jeff Pietruszynski
		Barbara Ladner
		Rena Bonnett
		Jessica Barnes-Pietruszynski
11-Oct-16	Historical Perspectives	Michael Workman
		Billy Joe Peyton
		Tae Park
12-Oct-16	International Perspectives	Miguel Zapata
		Carol Susman
		Jim Natsis
13-Oct-16	Quantitative Literacy	Michael Anderson
17-Oct-16		Ron Baker
15-Nov-16		Sonya Armstrong
		Linwei Nui
17-Oct-16	Wellness	Aaron Settle
		Katie McDilda
4-Nov-16	Arts & Humanities	Brenda Vanderford
		Susan Marsh-Minnerly
		Sherri Shafer
		Barbara Ladner
		Dirk Johnson
		Steve Gilliland
4-Nov-16	Social Sciences	Debbie Williams
		Frank Vaughan
		Paula McCoy
		Rebecca Francis
		Patricia Wilson
25-Jan-17	First Year Experience	Lindsey Good
		Jack Magan
		Kellie Toledo
		Barbara Ladner
		Sharon Banks
		Tom Guetzloff
		Derrick Spears

Mathematics elected to follow a different method of assessment development for general education courses. They chose to meet at smaller intervals with their assessment committee and invite both work session leaders to

each meeting. These meetings allowed them to develop and refine an exam consisting of twenty questions to be given at three points during a student's progression at the university. A rubric was developed that evaluated each of the five categories (or types) of exam items for reporting on student progress.

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II. Essential Graduation Competencies



The curriculum at West Virginia State University creates citizen-scholars by preparing students to take active roles within a democratic society while giving them the tools to face 21st Century challenges. To this effect, the curriculum works to foster knowledge across a broad range of liberal arts and science disciplines while helping students gain four specific competencies upon graduation (listed below).

1. Knowledge of Human Cultures and the Physical and Natural World - mapped to Tier II

- a. Demonstrate knowledge of ___ by engaging in both contemporary and enduring questions
 - i. Sciences – both [Laboratory Report Rubric](#) and [Critical Thinking in the Natural Sciences Rubric](#)
 - ii. Mathematics – [WVSU Quantitative Literacy Test](#)
 - iii. Wellness – [Wellness Plan Rubric](#)
 - iv. Social Sciences – [WVSU Social Sciences Ethical Reasoning Rubric](#)
 - v. Humanities – [WVSU Critical Thinking Rubric](#)
 - vi. History – [Historical Perspectives Rubric](#)
 - vii. International Perspectives – either [Language Skills Rubric](#) or [Intern. Persp. Rubric](#)
 - viii. Arts – [Creative Thinking Rubric](#)
-

2. Intellectual and Practical Skills Needed to Engage in 21st Century Challenges

- a. Practice Inquiry and analysis - (See Sciences above).
 - b. Employ critical and creative thinking - (See History, Arts and Humanities above).
 - c. Communicate effectively
 - i. Engl 101, 102, 112 – [Written Communication Rubric](#)
 - ii. Comm 100, Engl 201 - [Oral Communication Rubric](#)
 - d. Apply a quantitative approach to problem solving and evaluation – (See Mathematics above).
 - e. Practice effective collaboration/teamwork
-

3. Personal and Social Responsibility

- a. Model civic knowledge and engagement
 - b. Demonstrate understanding of multiculturalism and sensitivity to issues of diversity – [Cultural Competency Rubric](#)
 - c. Practice professional ethics in reasoning and action (See Social Sciences above).
-

4. Integrative and Applied Learning

- a. Demonstrate synthesis and advanced knowledge both within a specialization and between disciplines

These competencies are practiced extensively across the curriculum, in the context of progressively more challenging problems, projects, and standards of performance. Because they are integrated and assessed throughout the curriculum, fulfillment of the competencies can be accomplished through many pathways, including experiential learning.

III. General Education Assessment System

The General Education Assessment System Process began in the Spring of 2017. Faculty members teaching General Education courses volunteered to beta test the rubrics with course assignments during Spring 2017. The Office of Institutional Research will analyze the spring 2017 data to assess the effectiveness of the process.

Procedures. Assess the rubric in your course using an assignment or activity that is complex enough to enable the evaluator to use the rubric. Look at the example assignment for ideas about developing your own assignment or activity. You may choose to assess a number of assignments or activities as you determine which assignment or activity is best aligned with the rubric, but you only need to submit one set of scores.

After you collect data and review the scores, submit a report to the chair of the General Education Committee, Jeffrey Pietruszynski, and the Director of Institutional Research, Vicky Morris-Dueer. The report will contain information about which assignment you used to assess the General Education competency, your overall impression the process of implementing the General Education assessment process in your course, any difficulties you had in scoring and analyzing the scores, and suggestions for changes. This report can be submitted by email to jpietrus@wvstateu.edu and vicky.morris-dueer@wvstateu.edu.

A. *Science Assessment*

1. Laboratory Report Assessment

Here are several sample lab reports. The sample 2-part laboratory assignment on [endothermic and exothermic reactions](#) is not the only example. Appendix B contains other science labs that are complex enough to be scored by the REQUIRED elements of the [rubric](#). Appendix B contains the [Half or a Half Radioactivity Lab](#), the [Tracking Mars Lab](#), and the [Mid Ocean Ridge Lab](#).

Endothermic and Exothermic

Endothermic Reaction: Any chemical (or nuclear) reaction that absorbs energy, typically resulting in low temperatures around the site of the reaction.

Exothermic Reaction: Any chemical (or nuclear) reaction that gives off energy, typically as heat and/or light.

Reaction 1: Citric Acid and Baking Soda

Supplies:

25 mls citric acid	15 grams baking soda	Paper towels
Graduated cylinder	Triple beam balance	Thermometer
Styrofoam cup	stirring rod	

Methods:

1. Measure 25 mls of citric acid
2. Pour citric acid solution into the Styrofoam cup. Use thermometer to measure the temperature.
3. Measure 15 grams of baking soda and then stir it into the citric acid solution. Track the change in temperature.
4. The reaction is $\text{H}_3\text{C}_6\text{HO}_7(\text{Aq}) + 3\text{NaHCO}_3(\text{s}) \Rightarrow 3\text{CO}_2(\text{g}) + 3\text{H}_2\text{O}(\text{l}) + \text{NaC}_6\text{H}_5\text{O}_7(\text{Aq})$
5. Have teacher put lit incense stick in cup.
6. When you have completed your experiment rinse the cup and dispose of waste in waste bucket.
7. Report results to class

Results:

Molarity of citric acid solution:

What do you see inside the cup?

What do you feel while holding the cup?

What happens when your teacher puts the lit incense stick in the cup?

Record temperatures

Time (Seconds)	Temperature °C
Before reaction	
0:30	
1:00	
1:30	
2:00	
2:30	
3:00	
3:30	
4:00	

Make a graph and describe in words what happens to the temperature as time passes.

Is the reaction endothermic or exothermic? Why do you say this?

Does using different molarities make a difference?

Did reaction reach chemical equilibrium, i. e., did the slope of the graph become zero?

What gas was produced by the reaction? Why do you say this?

Reaction 2: Yeast and hydrogen peroxide

Supplies:

- | | |
|--|--------------|
| 1 tablespoon of quick rising dry yeast | thermometer |
| Styrofoam cup | water |
| $\approx 1/4$ cup hydrogen peroxide | paper towels |
| Tablespoon | |

Methods:

Pour $\approx 1/4$ cup hydrogen peroxide into the measuring cup. Record the temperature of the hydrogen peroxide. Add the yeast and stir the solution. Describe what happens and feel the lower side of the cup. If you have a watch or cell phone, record the temperature every thirty seconds or minute for approximately four minutes. When you are done pour the liquid into the disposal container. Rinse the measuring cup with water.

Results:

What do you see inside the cup?

What do you feel while holding the cup?

What happens when your teacher puts the lit incense stick in the cup?

Record temperatures

Time (Seconds)	Temperature °C
Before reaction	
0:30	
1:00	
1:30	
2:00	
2:30	
3:00	
3:30	
4:00	

Make a graph and describe in words what happens to the temperature as time passes.

Is the reaction endothermic or exothermic? Why do you say this?

Did Reaction reach equilibrium? Explain your answer?

What gas was produced by the reaction? Why do you say this?

What is a catalyst?

In the hydrogen peroxide experiment, which substance was the catalyst?

Laboratory Report Rubric

	4 Distinguished	3 Accomplished	2 Emerging	1 Novice
PURPOSE (REQUIRED)	Purpose includes a statement or question, which clearly reflects an understanding of the objective(s) of the experiment/lab activity.	Purpose includes a statement or question, which reflects an understanding of the objective(s) of the experiment/lab activity.	Purpose includes a statement or question, which reflects an incomplete understanding of the objective(s) of the experiment/lab activity.	Purpose includes a statement or question, which reflects a misunderstanding of the objective(s) of the experiment/lab activity.
PROCEDURE (Optional)	Includes a clear organized set of directions that can easily be followed by someone who did not do the lab. Procedure is written using academic and scientific language.	Includes a clear organized set of directions that can easily be followed by someone who did not do the lab.	Includes an unclear set of directions. Some steps may be: missing, incomplete, disorganized, difficult to follow.	Includes an unclear set of directions. Most steps may be: missing, incomplete, disorganized, difficult to follow.
REPRESENTATION (REQUIRED)	The data is appropriately represented in a well-organized graph, illustration and/or diagram.	The data is appropriately represented in an organized graph, illustration and/or diagram.	The data is represented in an organized graph, illustration and/or diagram.	The data is represented in an inappropriate or disorganized way.
Observations and Calculations (Optional)	In addition to accomplished, devise and use an organizational scheme to record data.	Descriptive observations and (accurate measurements using scientific tools OR access and record data from existing database)	Descriptive Observations	Observations lacking.
	Calculations, if required, are clearly shown, correct and complete; units are included.	Calculations, if required, are shown and complete but may contain minor errors; units are included.	Calculations show some work but are incorrect or missing units.	Most of the calculations are missing work.
ANALYSIS (REQUIRED)	The data analysis (identification of patterns) is clearly shown, is correct and complete. Ideas are applied to new situations.	The data analysis (identification of patterns) is shown, is mostly correct and complete.	The data analysis shown is very basic (restatement of the data), mostly complete but contains minor errors.	The data analysis shown is weak (refers to but does not include actual data) OR contains significant errors.

CONCLUSIONS (REQUIRED)	Evaluate results in the light of peers' results, teacher's explanations, or other scientific sources	Shares thoughts about his/her own thinking about the meaning of the results.	Conclusion accurately explains data.	Conclusion confusing or inaccurate.
WRITTEN COMMUNICATION (optional)	The report shows clear evidence of use of the writing process and is in final draft form.	The report shows evidence of use of the writing process and is in final draft form.	The report shows some evidence of use of the writing process and is in final draft form.	The report shows little evidence of use of the writing process.
	Focus is clearly stated and consistently referred to throughout the piece.	Focus is clearly stated and referred to throughout the piece.	Focus is unclear and/or is not referred to consistently throughout the piece.	Focus is unclear and is not referred to throughout the piece.
	Consistently uses a variety of transitions effectively and is written in a logical sequence.	Consistently uses transitions effectively and is written in a logical sequence.	Uses transitions and is written in a logical sequence.	Use of transitions is ineffective or work is not written in a logical sequence.
	Consistently uses a strong, formal, academic voice.	Consistently uses a formal, academic voice.	Does not consistently use a formal, academic voice.	Does not use a formal, academic voice.
	It contains few spelling and/or grammar errors.	It contains some spelling and/or grammar errors, which do not detract from the meaning of the work.	It contains some spelling and/or grammar errors, which detract from the clarity of ideas.	It contains many spelling and/or grammar errors, which significantly detract from the clarity of the written work.
	Contains the specified number of references, cited appropriately and covering all important topics.	Contains the specified number of references with some citation errors.	Contains less than the specified references.	References missing or citations are severely deficient

2. Scientific Reasoning and Nature of Science Activity

The essay questions below serve as *examples* of questions or assignments that can be used to evaluate the quality of the student's understanding of scientific reasoning. All essays below can be evaluated using the required elements of the Critical Thinking in the Natural Sciences [rubric](#).

BIOL 101: Principles of Biology

The subject of vaccinations. There was an outbreak of measles originating at Disneyland in December, 2014. At the national level the issue of parental choice in whether children should receive vaccinations has become a topic of debate. **Take a position on whether parents should be required to have their children vaccinated. Defend your position clearly by citing evidence from reliable sources.** In your paper, please address the following:

What is a vaccination? How does it work? What are the components of a vaccine? Can vaccinations have negative side effects?

What are some diseases that vaccinations have helped to control?

What are the reasons parents give for wanting their children exempt from vaccinations? Address the topic of 'herd immunity' and how it impacts this debate. What are the ramifications of unvaccinated children in the population? What populations of people are negatively impacted by this?

PHYS 111: Energy and the Environment

Describe the evidence for human caused climate change. Your essay should consider the following: 1) What evidence rules out alternative explanations for a warming climate (Hint: What are long-term drivers of climate other than greenhouse gases?)? 2) Is there evidence for a dose response effect giving specific examples of this effect? 3) What is the evidence that the Earth's climate has warmed in the last 150 years, giving specific examples for the sources of evidence? 4) How do computer models help us understand the causes of climate change? 5) What does the temperature of the stratosphere tell us about the mechanism for global warming and explain how this relates to the Mount Pinatubo experiment? 6) Describe the evidence for causation, i. e., an accepted physical process which would cause human induced climate change.

PHYS 101: Physical Science I

In science we don't have to directly observe a phenomenon to believe it exists or happens. Atoms are an example of this statement, nobody has ever seen an atom. In this essay you will describe the evidence for the existence of atoms. The first step of your essay is to define what an atom is and what are its characteristics? Then think about lectures, demonstration(s), video(s) and lab(s) done in class and video(s) on MyLab and cull from these sources evidence for the existence of atoms. In your essay may consider the following: What do these characteristics of atoms say about how atoms bind together to form substances such as compounds? Why did chemists accept the existence of atoms more than one hundred years before physicists? What evidence/explanation convinced physicists that atoms exist? Are atoms indivisible as suggested by Dalton?

PHYS 102: Physical Science II

The philosopher/historian of science Thomas Kuhn coined the term "Scientific Revolution". He wrote a book on the Copernican Revolution. You will write an essay on Copernican revolution drawing upon what you learned in lecture and lab. To do this you will need to describe the geocentric model and the heliocentric model. The goal of your essay is to explain why one of these models is presently preferred. You will need to explain who favored each of the models and what was their evidence to support their preferred model? Is there any evidence that falsifies one of the models?

PHYS 106: Introduction to Physical Geology

Plate tectonics is the central theory of geology. Describe the Theory of Plate Tectonics. What is the geologic evidence supporting the Theory of Plate Tectonics? (Hint: include evidence presented in lab, lecture and on Smartworks.)

Critical Thinking in the Natural Sciences Rubric

A rubric adapted for WV SU from the AACU Critical Thinking and Analysis/Inquiry VALUE Rubrics -- for more information, please contact value@aacu.org

Definition: Critical thinking in the natural science involves compiling observations/evidence; generalizing; testing generalization or analyzing evidence; and justifying conclusions based on results of experiments, observations/evidence.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance. (approved 11/3/2016)

	Capstone 4	3	Milestones 2	Benchmark 1
Explanation of issues (optional)	Issue/problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue/problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue/problem to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.	Issue/problem to be considered critically is stated without clarification or description.
Evidence (REQUIRED) <i>Selecting and using information to investigate a point of view or conclusion (from a topic of student's choice or an assigned topic, with assigned sources)</i>	Information is taken from source(s) with enough interpretation/evaluation to develop a comprehensive, defensible analysis or synthesis.	Information is taken from source(s) with enough interpretation/evaluation to develop a reasonable analysis or synthesis.	Information is taken from source(s) with some interpretation/evaluation, but not enough to develop a coherent analysis or synthesis.	Information is taken from source(s) without any interpretation/evaluation.
Influence of context and assumptions (optional)	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Analysis (REQUIRED)	Organizes and synthesizes evidence to reveal insightful patterns, differences, or similarities related to focus.	Organizes evidence to reveal important patterns, differences, or similarities related to focus.	Organizes evidence, but the organization is not effective in revealing important patterns, differences, or similarities.	Lists evidence, but it is not organized and/or is unrelated to focus.
Conclusions and related outcomes (REQUIRED) (implications and consequences)	Conclusions and related outcomes (consequences and implications) are logical extrapolations and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, which may include opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.

B. Mathematics Assessment

WVSU Quantitative Literacy Assessment

The WVSU Department of Mathematics developed a 20-question Multiple Choice Test in Fall 2016 that assesses five key areas with four questions for each area. The five areas are: *Data, Computation, Estimation, Reasoning, and Probability*. Because this is a Multiple Choice assessment, it will be stored securely by the Chair of the Mathematics who will distribute it as needed to faculty members who teach the courses that are designed to fulfill the General Education Mathematics requirements for WVSU programs. Number correct for each of the five key areas will be assigned to this rubric and the rubric scores will be reported.

	Mastery	Developed	Emerging	Inchoate
Data	4 out of 4 correct	3 out of 4 correct	2 out of 4 correct	Less than 2 correct
Computation	4 out of 4 correct	3 out of 4 correct	2 out of 4 correct	Less than 2 correct
Estimation	4 out of 4 correct	3 out of 4 correct	2 out of 4 correct	Less than 2 correct
Reasoning	4 out of 4 correct	3 out of 4 correct	2 out of 4 correct	Less than 2 correct
Probability	4 out of 4 correct	3 out of 4 correct	2 out of 4 correct	Less than 2 correct

C. Wellness Assessment

The directions for students for a typical Comprehensive Wellness Plan assignment for HHP 157 is below. This serves as an *example* of a typical general education assignment for all wellness courses. The written plan that a student will develop, based on this assignment, will align very well with the elements of the Wellness Plan [rubric](#).

HHP 157

Comprehensive Wellness Plan Assignment

Assignment Information: Up to this date in this course, we have studied all of the Wellness Domains associated with your personal health. As we assessed during our studies, we have found that as individuals we find strength and weakness in different domains of health. As we have learned, we know it is imperative to practice continual awareness and work towards strengthening our strengths and correcting our weaknesses so that we may live a long, healthy, happy and productive life.

Your Assignment: You will be charged with creating a Wellness Plan. The set format for this assignment will be a written paper in paragraph form with Paragraphs associated with the different domains PHYSICAL, EMOTIONAL and SOCIAL being clearly identified). This Wellness Plan MUST identify step by step methods

with good detail and example behavior that you will execute to improve your overall wellbeing in the areas of Physical, Mental and Emotional Health. (These three areas of planning will be the most critical to work towards for this assignment). As you are creating your in-depth plans for the three domains, you will also need to identify/address how the improvements you seek based on your plan will help you improve the areas of Environmental, Intellectual, Spiritual and Financial Health, as we have discussed in class.

Writing Specifics: Your wellness plan is to be type written in a Times New Roman font of 12 and double spaced. There is NO maximum in page length as you may want to include charts, calendars, etc. with your plans. However, each step by step plan for each domain should utilize about a page length of detail minimally. So a three (3) page minimum is expected.

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WVSU Wellness Plan Rubric: Students will evaluate their personal Wellness using various measures and develop a Wellness plan to improve their scores. The rubric evaluates the plan.

Element of Wellness	Distinguished (4 points)	Accomplished (3 points)	Emerging (2 points)	Unsatisfactory (1 point)
Emotional	Plan includes a step-by-step outline of what is to be done to work toward and achieve the goal of emotional wellness. Possible barriers or obstacles are listed along with ways they might be overcome.	In addition to Emerging criteria, Plan includes some details about what is to be done and few details about overcoming potential barriers.	Plan includes a goal statement about Emotional Wellness that is clear, specific, measurable, and attainable.	Plan includes a statement of what is to be done.
Mental	Plan includes a step-by-step outline of what is to be done to work toward and achieve the goal of mental wellness. Possible barriers or obstacles are listed along with ways they might be overcome.	In addition to Emerging criteria, Plan includes some details about what is to be done and few details about overcoming potential barriers.	Plan includes a goal statement about Mental Wellness that is clear, specific, measurable, and attainable.	Plan includes a statement of what is to be done.
Physical	Plan includes a step-by-step outline of what is to be done to work toward and achieve the goal of physical wellness. Possible barriers or obstacles are listed along with ways they might be overcome.	In addition to Emerging criteria, Plan includes some details about what is to be done and few details about overcoming potential barriers.	Plan includes a goal statement about Physical Wellness that is clear, specific, measurable, and attainable.	Plan includes a statement of what is to be done.
Relationship between domains	Plan includes a rationale for why the four domains of Intellectual, Spiritual, Environmental and Financial wellness contribute to Emotional, Mental and Physical Wellness.	Plan includes a rationale for why three of the four domains of Intellectual, Spiritual, Environmental and Financial wellness contribute to Emotional, Mental and Physical Wellness.	Plan includes a rationale for why two of the four domains of Intellectual, Spiritual, Environmental and Financial wellness contribute to Emotional, Mental and Physical Wellness.	Plan includes a rationale for why one or fewer the four domains of Intellectual, Spiritual, Environmental and Financial wellness contribute to Emotional, Mental and Physical Wellness.

D. Social Sciences Assessment

The two assignments below serve as *examples of assignments* that might be used in Social Science courses that can be assessed using the Social Sciences Ethical Reasoning [rubric](#).

Psychology 151: Final Homework Assignment

This assignment is a combination computer and written assignment. You are to research the Andrea Pia Yates trial and write a minimum of a one and one half page, double-spaced, typed report on whether or not you believe her behavior was due to some form of psychological disorder. If your belief was that Yates had a psychological disorder, you will be required to substantiate this belief with symptoms reported from the trial which fits the symptom pattern of the disorder you believe she exhibited.

If you do not believe she had a psychological disorder, then you must explain the behavior by another means (for example, a moral problem) and **present accompanying research data** to receive full credit. Hint: It is easier to substantiate a psychological disorder.

When you have decided whether or not your finding is a psychological disorder or a moral problem, then discuss what you believe the ethical responsibility of society is 1) in terms of dealing with Andrea Pia Yates and 2) in terms of protecting innocents who may fall victim to such crimes (Examples: society is responsible for providing treatment in the case of psychological illness or incarceration/punishment/ rehabilitation if the perspective is that the problem is a moral/legal issue).

You will need one reference as to the findings of the trial and one reference on whatever disorder you feel she had, e. g., major depressive disorder with postpartum onset (use appropriate DSM-V diagnosis for this for full credit), schizophrenia, antisocial personality disorder.

References are to be submitted with the paper. Suggested websites to obtain this information are: www.apa.org and www.abcnews.com. You may also refer to information discussed in class or your textbook regarding psychological disorders in your paper.

There is no one “correct” diagnosis on which you will be graded. Several diagnoses can be successfully argued. You will be graded upon giving examples from the trial of symptoms which support the particular diagnosis you select. You will also be graded on accurate reporting of information. A description of what Andrea Yates did is **NOT** to be included—that is well known. Points will be deducted if this is primarily what you submit.

This assignment is worth 25 points of your total homework points.

Again, this report must be **typed and** it must be **stapled** or points will be deducted. The content of this assignment will be scored using the **REQUIRED elements of the rubric** on the next page (not the optional elements). Be sure to include at least two **perspectives**, for example (judge, minister, psychologist OR of two or more ethical theories). When you talk about the ethical issues be sure to discuss their complexities and interrelationships.

Education 201: Student Assistance Team Assignment

The Student Assistance Team assignment fulfills the requirements for the Social Science requirements of the General Education Curriculum. The assignment will assist the candidates in:

1. The development of an understanding of the various causes of human behaviors.
Candidates will demonstrate an understanding of the physical, cognitive, social and emotional domains and how they impact the development of children.
2. The identification of the ways in which social structures affect children.
3. The demonstration of knowledge of the various terms and concepts related to the study of social structure and behavior.
4. The demonstration of knowledge of the interrelatedness of social institutions.

ACTIVITIES

The teacher education and social work candidates enrolled in this course will complete activities designed to assist in developing a thorough understanding of child development by acquiring the following:

1. ***Knowledge of both the sequence of child development and the processes that underlie it.***
Students are provided with a description of the organized sequence of development along with processes of change. An understanding of process – how complex interactions of biological and environmental events produce development – will be the focus of developing an understanding of the various causes of human behaviors.
2. ***An appreciation of the impact of context and culture on child development.***
Research indicates that children live in rich physical and social contexts that affect all domains of development. In addition to highlighting the role of immediate settings, such as family, neighborhood, and schools, students will be exposed to the impact of larger social structures – societal values, laws and government programs on children’s well-being.
3. ***A focus on the interrelatedness of theory, research and applications.***

Theories of child development and the research stimulated by them provide the foundations for sound, effective practices with children. The links among theory, research and applications will be reinforced by an organizational format in which theory and research are presented first, followed by practical implications. In addition, a current focus in the field of child development -- harnessing child development knowledge to

shape social policies that support children’s needs – will be researched. Candidates will develop a knowledge of various terms and concepts related to the study of social structure and behavior.

IMPLEMENTATION OF THE ASSIGNMENT

1. Students will focus on the four domains of child development: physical, cognitive, social and emotional.
2. Students will study and research the purpose and functions of the Student Assistance Teams.
3. Students will view the video “Cipher in the Snow” and will develop a Student Assistance Team Plan which will focus on:
 - a. Identification of the problems related to the four domains
 - b. Researching the social structures that can assist with a child’s development
 - c. Researching theories that support a current focus in the field of child development -- utilizing child development knowledge to shape social policies that support children’s needs.

WVSU General Education Social Sciences ETHICAL REASONING RUBRIC

Definition: Ethical Reasoning is reasoning about right and wrong human conduct. It requires students to be able to assess their own ethical values and the social context of problems, recognize ethical issues in a variety of settings, think about how different ethical perspectives might be applied to ethical dilemmas, and consider the ramifications of alternative actions. Students' ethical self-identity evolves as they practice ethical decision-making skills and learn how to describe and analyze positions on ethical issues.

	Capstone 4	Milestones 3 2		Benchmark 1
Ethical Self-Awareness (Optional)	Student discusses in detail/analyzes both core beliefs and the origins of the core beliefs and discussion has greater depth and clarity.	Student discusses in detail/analyzes both core beliefs and the origins of the core beliefs.	Student states both core beliefs and the origins of the core beliefs.	Student states either their core beliefs or articulates the origins of the core beliefs but not both.
Understanding Different Ethical Perspectives/Concepts (REQUIRED)	Student names the perspective or perspectives, can present the gist of said perspective or perspectives, and accurately explains the details of the perspective or perspectives used.	Student can name the perspective or perspectives she/he uses, can present the gist of said perspective or perspectives, and attempts to explain the details of the perspective or perspectives used, but has some inaccuracies.	Student can name the perspective she/he uses, and is only able to present the gist of the named perspective.	Student only names the perspective she/he uses.
Ethical Issue Recognition (REQUIRED)	Student can recognize ethical issues when presented in a complex, multilayered (gray) context AND can recognize cross-relationships among the issues.	Student can recognize ethical issues when issues are presented in a complex, multilayered (gray) context OR can grasp cross-relationships among the issues.	Student can recognize basic and obvious ethical issues and grasp (incompletely) the complexities or interrelationships among the issues.	Student can recognize basic and obvious ethical issues but fails to grasp complexity or interrelationships.
Application of Ethical Perspectives/Concepts (REQUIRED)	Student can independently apply ethical perspectives/concepts to an ethical question, accurately, and is able to consider full implications of the application.	Student can independently (to a new example) apply ethical perspectives/concepts to an ethical question, accurately, but does not consider the specific implications of the application.	Student can apply ethical perspectives/concepts to an ethical question, independently (to a new example) and the application is inaccurate.	Student can apply ethical perspectives/concepts to an ethical question with support (using examples, in a class, in a group, or a fixed-choice setting) but is unable to apply ethical perspectives/concepts independently (to a new example.).
Evaluation of Different Ethical Perspectives/Concepts (Optional)	Student states a position and can state the objections to, assumptions and implications of and can reasonably defend against the objections to, assumptions and implications of different ethical perspectives/concepts, and the student's defense is adequate and effective.	Student states a position and can state the objections to, assumptions and implications of, and respond to the objections to, assumptions and implications of different ethical perspectives/concepts, but the student's response is inadequate.	Student states a position and can state the objections to, assumptions and implications of different ethical perspectives/concepts but does not respond to them (and ultimately objections, assumptions, and implications are compartmentalized by student and do not affect student's position.)	Student states a position but cannot state the objections to and assumptions and limitations of the different perspectives/concepts.

E. Humanities Assessment

The essay questions below, from an English 150 course, serve as *examples* of the type of essay question that can be used to generate a response that shows that the student is engaging in Critical Thinking. Either of these essays can be evaluated by the Critical Thinking [rubric](#).

1. Considering the William Carlos Williams Short Story, "The Use of Force," take a position on whether it is necessary to use force to maintain procedures in social institutions (schools, hospitals, cities, etc.)? Use evidence from the text, your own experiences and other sources if desired, to support your position.
2. Considering the D. H. Lawrence short story, "The Rocking Horse Winner," compare the attitude and actions of the Mother character to an individual (or institution) in contemporary society who is obsessed by the desire for the finer things in life. Use evidence from the text, your own experiences and other sources if desired, to support the comparison.

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WVSU CRITICAL THINKING RUBRIC

Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information

Definition: critical thinking is a habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion.

	Capstone 4	Accomplished 3	Developing 2	Beginning 1	Unacceptable 0
Identification and explanation of issues (REQUIRED)	Issue to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding.	Issue to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions.	Issue to be considered critically is stated but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.	Issue to be considered critically is stated without clarification or description.	Issue to be considered critically is not stated.
Collection of information (REQUIRED)	Information* taken from source(s) is sufficient to develop a comprehensive analysis and synthesis.	Information taken from source(s) is sufficient to develop a coherent analysis and synthesis.	Information taken from source(s) is insufficient to develop coherent analysis and synthesis.	Information taken from source(s) is insufficient to develop any analysis and synthesis.	No source information is provided.
Recognition of context and assumptions (OPTIONAL)	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts before presenting a point of view**.	Identifies own and others' assumptions and several relevant contexts before presenting a point of view**.	Questions some assumptions. May be more aware of others' assumptions than one's own (or vice versa). Identifies several relevant contexts before presenting a point of view.	Shows an emerging awareness of present assumptions (sometimes takes facts as assumptions – or vice versa). Begins to identify some contexts before presenting a point of view.	Shows no awareness of present assumptions. Does not identify contexts before presenting a point of view.
Evaluation and Synthesis of information (REQUIRED)	The evaluation of information is thorough, taking into account the complexities of an issue, while acknowledging limits and synthesizing other points of view.	The evaluation of information is sufficient, taking into account some complexities of an issue, while acknowledging some limits and synthesizing other points of view.	The evaluation of information is incomplete, not taking into account the complexities of an issue.	The evaluation of information is simplistic, obvious, or has limited relevance.	No evaluation of information is provided.
Conclusions and related outcomes (REQUIRED)	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly.	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified.	No conclusion is provided.

*Information includes observations, experts' sources, or empirical data. **Point of view includes hypothesis, thesis, conditions, or perspectives.

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F. History Assessment

The assignment below is from an American History course, and it serves as an *example* of a History Assignment that can be scored using the Historical Perspectives [rubric](#).

HISTORY 208: U.S. HISTORY SINCE 1865

HAWAIIAN MONARCHY GOVERNMENT OVERTHROW HOMEWORK

When you explain your answers for the questions below, refer to the rubric on Historical Perspectives. Be sure to include your analysis of what the major issues / factors that influenced the historical event (or may influence a different event). When defending your position, it is beneficial to cite the historical document (and may also be beneficial to cite your text or another source) as evidence for your position. You will be evaluated on all five elements of the rubric so be sure to communicate clearly and professionally.

1. Access the website: <http://www.alohaquest.com/archive/soa.htm>

Read *The Overthrow of the Monarchy* essay (Pitzer, 1994) on the 1893 revolution in Hawaii, then answer the following questions in essay format (Times Roman 12-pt. font, 2-4 double-spaced paragraphs each):

- A. Briefly summarize the events leading to the overthrow of the sovereign Hawaiian government, and explain whether you feel it was a justified action at the time. Why or why not?
- B. Under the Bayonet Constitution, describe which group received the right to vote in Hawaiian elections and which group lost their dominance at the polls and in the legislature. Is there a potential problem with this action? Why or why not?
- C. Explain what position President Grover Cleveland took in the overthrow situation, and describe whether he was **successful in having an impact on the outcome. Why or why not?**

2. Access the website: http://www.alohaquest.com/archive/apology_full.htm

Read *U.S. Public Law 103-150*, the 1993 “Apology Resolution,” and answer the following questions in essay format (Times Roman 12-pt. font, 2-4 double-spaced paragraphs each):

- A. Describe the basic tone of the Apology Resolution. How and why was it delivered to the Hawaiian people?
- B. Personally speaking, do you agree or disagree with the Apology Resolution? If you were a Native Hawaiian, what do you think the logical conclusion to this situation should be--future independence for your native land or continued statehood as part of the USA? Explain your answers.

The Historical Perspective Rubric

GOALS	Level 5 Excellent	Level 4 Good	Level 3 Satisfactory	Level 2 Fair	Level 1 Poor
Communication in an historical context. (OPTIONAL)	Presents a well-organized, persuasive argument with accurate supporting historical evidence. Shows maturity (variety) in diction and/or sentence structure. Clearly expressed a central idea using appropriate paragraphing and transition with a conclusion. Cites sources correctly.	Presents an organized argument with only minor errors in supporting historical evidence. Has an identifiable central idea and appropriate paragraphing. May have a few grammatical errors but they do not detract from the content. May have minor mistakes in the citing of source materials.	Presents a somewhat organized argument. Uses general terms with limited historical evidence. Is coherent and unified but may have paragraphing errors and lack of transitions. Has some grammatical errors but they do not interfere with readability. May have major mistakes in the citing of some source materials.	Only minimal organization in presentation. Uses historical generalities to support position with little or no evidence. Is reasonably coherent, but lacks continuity. May have problems with usage, grammar, or syntax that interfere with readability. May have mistakes in the citing of most source materials.	Unorganized with unrelated general statements and no supporting historical evidence. Is minimally coherent with significant problems with grammar, syntax, or usages. Misuses and incorrectly cites source materials.
Critical Thinking in an Historical Context. (REQUIRED)	Bases conclusions on a thorough examination of the evidence. Offers an accurate analysis of the evidence. Deals with all significant issues and demonstrate an understanding of important relationships.	Bases conclusions on examination of the major evidence. Offers an accurate but generalized analysis of the evidence. Deals with major issues and demonstrates some understanding of important relationships.	Bases conclusions on a partial examination of the evidence. Offers an analysis of the evidence, which is not totally accurate. Deals with a limited number of issues.	Bases conclusions on a cursory examination of the evidence. Mixes facts and opinion as evidence. Emphasizes only one or two issues.	Bases conclusions on only one or two pieces of evidence. Offers unsupported opinion as evidence. Emphasizes only one issue.
Context of Historical Change (REQUIRED)	Demonstrates a clear, accurate understanding of how historical change occurs. Identifies multiple causes that contributed to the change. Articulates multiple ramifications of change.	Demonstrates a clear understanding of how historical change occurs. Identifies some causes that contributed to the change. Articulates some ramifications of change.	Demonstrates a general understanding of how historical change occurs. Identifies a few causes that contributed to the change. Articulates a few ramifications of change.	Demonstrates a cursory understanding of how historical change occurs. Identifies only one or two causes that contributed to the change. Articulates one or two ramifications of change.	Demonstrates little understanding of how historical change occurs. Identifies one cause that contributes to the change. Articulates one ramification of the change.
Evaluation and Synthesis of information (REQUIRED)	The evaluation of information is thorough, taking into account the complexities of an issue, while acknowledging limits and synthesizing other points of view.	The evaluation of information is sufficient, taking into account some complexities of an issue, while acknowledging some limits and synthesizing other points of view.	The evaluation of information is incomplete, not taking into account the complexities of an issue.	The evaluation of information is simplistic, obvious, or has limited relevance.	No evaluation of information is provided.
Knowledge and appreciation of diverse cultures, aesthetic, and/or intellectual viewpoints and milieus. (REQUIRED)	Critically analyzes different perspectives. Demonstrates acceptance of other viewpoints and opinions. Demonstrates the ability to embrace different cultural ideals, intellectual viewpoints and milieus.	Analyzes different perspectives. Demonstrates some acceptance of other viewpoints and opinions. Demonstrates the ability to accept different cultural ideals, intellectual viewpoints and milieus.	Tolerates different perspectives. Demonstrates limited acceptance of other viewpoints and opinions. Demonstrates limited ability to accept different cultural ideals, intellectual viewpoints and milieus.	Shows limited toleration of different perspectives. Demonstrates little acceptance of other viewpoints or opinions. Demonstrates little ability to accept different cultural ideals, intellectual viewpoints and milieus.	Does not tolerate different perspectives. Demonstrates no acceptance of other viewpoints or opinions. Unwilling to accept different cultural ideals, intellectual viewpoints and milieus.

Adapted from instruments used by Winthrop University and Stephen F. Austin State University.

G. International Perspectives Assessment

A. Specific assignment for Courses that do not involve language learning

The Assignment below is from a Spanish Culture course taught in English. It is an example of an assignment that can be evaluated using the International Perspectives [Rubric](#).

Span 205 Assignment

Research or investigate a cultural practice, product, or issue (You may use our textbooks on Cultural Perspectives or Cultural History as a reference). [Example: song, painting, sculpture, castle, film, perspective, stereotype, etc.] Prepare a Power Point Presentation including at least the following:

- 1- Describe and discuss the practice, product, or issue.
- 2- Situate it in its historical context
- 3- Explain at least two possible/connected causes of it (art, religion, philosophy, economy, ethnicity, history, etc.)
- 4- Describe/illustrate what insights/perspective you have gained that could be applicable to the culture of your native country.

**** Keep the following guidelines as a reference.

This assignment is worth 100 points total, with 80 points for Content and 20 points for Form.

A. Content:

States thesis clearly and justifies its importance: 10 pts.

Describes and develops issue from Spanish culture: 15 pts

Describes the society to which the cultural issue belongs [Context]: 15 pts

Establishes the connections between the issue and its society [Possible causes. Consider economy, religion, philosophy, ethics, history, etc.]: 15 pts

Establishes connections between the studied issue and his-her own culture 15 pts

Source material: 10 pts.

Note that the content of this assignment will be scored for attainment of General Education Competency using the International Perspectives Rubric on the next page.

B. Form:

Audio/visual aids (charts, handouts, tapes, Power Point, etc.)

Demeanor and audibility: 20 pts.

International Perspectives Rubric

	Exemplar (4 pts)	Target (3 pts)	Acceptable (2 pts)	Unacceptable (1 pt)	NA
Cultural Product or Practice ACTFL	Fully describes a cultural product or cultural practice with attention to detail and the description is always accurate.	Describes a cultural practice or a cultural product in a complete manner.	Describes a cultural product or practice, but there may be some inaccuracies.	Does not give a complete description of a cultural product or practice or there are many inaccuracies.	
PERSPECTIVES ACTFL	Fully demonstrates the connection between the selected cultural product or practice and the perspectives of the society to which it belongs with attention to at least two elements, like history, economy, religion, etc..	Establishes the connection between the selected cultural product or practice and the perspectives of the society to which it belongs with attention to at least one societal element, like history, economy, religion, etc.	Establishes the connection between the selected cultural product or practice and the perspectives of the society to which it belongs although the connection is not always so strong or well developed.	Fails to establish the connections between the cultural product or practice and the society to which it belongs.	
Knowledge <i>Cultural Self-awareness</i> ACTFL	Articulates insights into own cultural rules and biases; can explain how his/her experiences have shaped these rules; can explain how to recognize and/or respond to cultural biases.	Articulates new perspectives about own cultural rules and biases and can express the complexities that new perspectives offer.	Identifies own cultural rules and biases and can identify a few cultural rules and biases of the new culture.	Fails to explain the cultural rules and biases of his/her own cultural group; is unable to identify cultural differences with that of the new culture.	

For Language Learning Courses

General Education Assessment - Modern Foreign Language – Oral Interpersonal Rubric

Description

This assessment is used during the first year Modern Foreign Language courses that are in the General Education International Perspectives Curriculum. Currently these courses are SPAN 101, SPAN 102, FREN 101, FREN 102, GERM 101 and GERM 102.

Typically, this Oral Interpersonal Assessment is administered near the end of the semester in which the student takes one of the courses listed in the previous paragraph. The course instructor conducts a one-on-one interview with the student, in which the instructor asks questions and guides the student in a conversation in the target language to explore the limits of the student's target language usage. The conversation continues until (in the opinion of the MFL instructor) the student has demonstrated his or her oral target language abilities to the greatest extent possible.

The conversation follows the guidelines and protocols established by the ACTFL OPI Interview.

The [rubric](#) used to score the conversation follows on the next page.

DRAFT

**General Education Assessment - Modern Foreign Language – Oral Interpersonal Rubric
Novice Level (ACTFL)**

Criteria	Exceeds Expectation	Meets Expectation (Strong)	Meets Expectation (Minimal)	Does not meet expectation
Language Function	Creates with languages by combining and recombining known elements; is able to express personal meaning in a basic way. Handles successfully a number of uncomplicated communicative tasks in straightforward social situations, primarily in concrete exchanges and topics necessary for survival in target-language culture.	Uses mostly memorized language with some attempts to create. Handles a limited number of uncomplicated communicative tasks involving topics related to basic personal information and some activities, preferences and immediate needs.	Uses memorized and familiar language only.	Has no real functional ability.
Text Type	Uses some simple sentences and memorized phrases.	Uses words, phrases, chunks of language, and lists.	Uses simple sentences and some strings of	Uses isolated words.
Communication Strategies	Responds to basic direct questions and requests for information. Asks a few formulaic questions but is primarily reactive. May clarify by repeating and/or substituting different words.	Responds to a limited number of formulaic questions. When called on to handle topics at the intermediate level, may use repetition or resort to their native language.	When called on to handle topics at the intermediate level, frequently resorts to repetition, words from the speaker's native language, or silence.	Is unable to participate in a true conversational exchange.
Phonetic Accuracy	Is generally understood by those accustomed to interacting with non-natives.	Is generally understood by those accustomed to interacting with non-natives, although repetition or re-phrasing may be required.	Is understood with difficulty by those accustomed to interacting with non-natives.	Most of what is said is unintelligible or understood only with repetition.
Language Control	Is most accurate when producing simple sentences in present time. Pronunciation, vocabulary, and syntax are strongly influenced by the native language. May sound surprising fluent and accurate when using stock phrases and learned material, but accuracy decreases as language becomes more complex.	Is most accurate with memorized language, including phrases. Accuracy decreases when creating and trying to express personal meaning.	Accuracy is limited to memorized words. Accuracy may decrease when attempting to communicate beyond the word level.	Has almost no accuracy even with memorized words.

H. Arts Assessment

Here are two examples of Arts assignments that can be scored using the Creative Thinking [rubric](#). The first one is from the 100% online Art 101 class. The second one is from the Communications 170, Theater Appreciation class.

Illusion of Motion

Instructions:

Read the lecture file on motion. Then, create the illusion of motion effectively utilizing at least two of the methods outlined in the visual presentation.

Compositional factors such as cropping the image, leaving open space following the direction of the suggested motion, and balancing the visual weight of various compositional elements should be considered.

Render the project **ONLY with the paint tools**, and create some kind of framing device to enhance the illusion of motion.

Grading will be based on the following:

- *Is there a strong sense of suggested motion?*
- *Use of framing device*
- *Application of elements and principles already learned*
- *Neatness, organization, obvious effort*

THEATRE APPRECIATION FINAL PROJECT GUIDELINES

Each final project will include a typed (minimum) two-page paper carefully analyzing why you made the specific decisions that you made based on information studied during the semester. This doesn't mean how you rehearsed the monologue for example; it means that you followed the material covered in Chapter 7 and did the homework that is required of an actor studying a role. Ditto for design and writing.

Using one of the plays read this semester as a foundation, you will put into practice one aspect of the art of theatre as studied in the class. You can do any of the following:

1. **Perform** a monologue which is a speech given by only one character.

- a. This must be a minimum of 2 minutes.
 - b. It must be memorized and staged, meaning that you must have movement, costume and props appropriate to the character.
2. Perform a scene in which you are interacting with one or more characters.
 - a. Each actor must do individual written work specific to their character.
 - b. This must be a minimum of 5 minutes.
 - c. All characters must be on stage at all times.
 - d. It must be memorized and rehearsed with your partner(s). The entire scene must show evidence of intentional blocking to help communicate the meaning of the scene.
 - e. You must have costumes and props.
3. Design and MAKE a model of a set or a costume
 - a. These will be evaluated on the extent of your creative thought and insight into the design. I encourage you to use “found” materials and not to spend money purchasing items for either.
4. Write a one-act play which follows the story of a character beyond the end of the final play
 - a. The one-act will be a minimum of ten pages following standard script format. These are easily found online.
 - b. Your play can take whatever twists you desire but the character must begin as he/she was at the end of the original play. E.g., you can't decide that Hallie was an orphan and that's why Sam befriended him.

CREATIVE THINKING VALUE RUBRIC

Definition

Creative thinking is both the capacity to combine or synthesize existing ideas, images, or expertise in original ways and the experience of thinking, reacting, and working in an imaginative way characterized by a high degree of innovation, divergent thinking, and risk taking.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	3	Milestones 2	Benchmark 1
Acquiring Competencies <i>This step refers to acquiring strategies and skills within a particular domain.</i>	Reflect: Evaluates creative process and product using domain-appropriate criteria.	Create: Creates an entirely new object, solution or idea that is appropriate to the domain.	Adapt: Successfully adapts an appropriate exemplar to his/her own specifications.	Model: Successfully reproduces an appropriate exemplar.
Taking Risks <i>May include personal risk (fear of embarrassment or rejection) or risk of failure in successfully completing assignment, i.e. going beyond original parameters of assignment, introducing new materials and forms, tackling controversial topics, advocating unpopular ideas or solutions.</i>	Actively seeks out and follows through on untested and potentially risky directions or approaches to the assignment in the final product.	Incorporates new directions or approaches to the assignment in the final product.	Considers new directions or approaches without going beyond the guidelines of the assignment.	Stays strictly within the guidelines of the assignment.
Solving Problems	Not only develops a logical, consistent plan to solve problem, but recognizes consequences of solution and can articulate reason for choosing solution.	Having selected from among alternatives, develops a logical, consistent plan to solve the problem.	Considers and rejects less acceptable approaches to solving problem.	Only a single approach is considered and is used to solve the problem.
Innovative Thinking <i>Novelty or uniqueness (of idea, claim, question, form, etc.)</i>	Extends a novel or unique idea, question, format, or product to create new knowledge or knowledge that crosses boundaries.	Creates a novel or unique idea, question, format, or product.	Experiments with creating a novel or unique idea, question, format, or product.	Reformulates a collection of available ideas.
Connecting, Synthesizing, Transforming	Transforms ideas or solutions into entirely new forms.	Synthesizes ideas or solutions into a coherent whole.	Connects ideas or solutions in novel ways.	Recognizes existing connections among ideas or solutions.

I. Written Communication Assessment

There are two sample assignments below. The first one is a typical end of semester assignment for English 101, and the [second one](#) is a typical end of semester assignment for English 102. Either one is complex enough to give the student an opportunity to succeed when scored with the Written Communication [rubric](#).

**West Virginia State University
English 101
Paper 4**

Requirements:

- 4 – 6 pages
- Double Spaced
- 12-pt. Times New Roman font
- “real world” audience / forum

Life’s a Beach... Or NOT!!!

Introduction:

In paper one, each of you told a story in order to provide a point for the reader. We expanded from just expressing a point to comparing and contrasting an object and then practiced evaluation in paper three. Now, we are going to be combining the patterns of all three in order to relate our position on something going on in society.

Let’s face it, there is something going on in our lives right now that we don’t understand, we question, or just simply makes us mad. This paper will be your opportunity to attempt to change an audience’s thinking, make them see a subject in a new light, or explain your point of view on something you think is important. Basically, you are getting the opportunity to write about an issue or problem you feel is important because it affects you in some way shape or form.

To begin, I should stress that this task is not simply a place for you to complain about an issue or to attempt change on something beyond your control. In other words, you will be responsible for creating a logical argument, NOT ranting and raving. Also, your topic needs to be limited to something you can prove in 4 – 6 pages. This means that you will not be able to handle huge controversial issues in this paper (do you really think you can solve world peace in 6 pages?). Way too common issues such as abortion, gay rights, and war are also way too complex for the length of this paper. This is not to say that you cannot discuss them, but if you choose to do so, you will need to find a way to narrow down the topic. I would suggest looking at these topics from your personal point of view... if it is something that affects you personally and you can make it meaningful to you, OK, if not, choose another topic.

Also important to mention is that I want you to pick a topic that has multiple (3 or more) perspectives. You are not looking at this issue in terms of wrong or right, but with the idea that different people have different ways of approaching the subject. For example, Some people may say the war in Iraq is justified, others disagree. However, what is more important is WHY they believe they way they do. Some say our decision to go to war may have been unjustified, but it was still necessary to go. Others may disagree with the war completely and claim that is because of oil, and still others may disagree on the basis that each county should be free to do what they choose or that the US is not the world’s policemen. Each of these ideas are important and each could be

addressed while explaining “your” perspective. One of the first things we will do is to find these different perspectives.

Paper Description and Examples

As I showed in the introduction, the topic of your paper is pretty much open. As long as you can justify your focus as being an issue currently in society, is currently affecting you, and has multiple perspectives, it is a valid choice to write upon. You may choose to work a problem that is Global, or national (just be sure it fits the above requirements) or you can focus to a state, city, or local problem (even down to the community surrounding college life)

However, if you are still confused, here are some examples of past papers done by students:

1. National / Global issue:

- a. **Female soldiers in combat:** This student, who was part of the military, wrote a paper on how she wanted to be able to fight on the front lines but was not able because she was a woman. She looked at the perspectives of gender roles, physical limitations, and career advancement and created an argument that basically said that if women want to be in combat and can meet the requirements set by the military they should be allowed to do so because to deny them was discrimination.
- b. **Same-Sex marriage:** In this paper, the student used the issue of same-sex marriage to discuss the perspectives of traditional marriages, family benefits, and family life. Her argument was that even if people did not believe in a same sex marriage, they should be open to allowing social and legal benefits for same sex couples. This was a valid choice for the paper because she discussed the topic because, as someone in a long term same sex relationship, these issues affected her every day in many different ways.

2. City / State issue:

- a. **State Drinking age:** Normally, this paper would be a rant by an underage student about how it is unfair that they could fight in war but cannot drink. If this was the focus, this would not have been a good paper. Instead, this student came from a European country where drinking (especially wine) was a socially acceptable norm. When he moved to America, he could no longer drink wine with his meals. His focus was NOT complaining at the age, but on social feelings of alcohol consumptions in different countries.

3. Local Issue:

- a. **Parking on Campus:** if you think parking on this campus is difficult, you should have seen it at this student’s campus. Tired of having to walk 10 minutes from his car to class, his argument was that the college should assign parking by your relationship to the school. In other words, people who have been there longer should park closer. Faculty should park in one place, students another. He looked at the situation from each perspective (including the current one) and attempted to come up with a viable solution to parking.
- b. **Banning of Certain Breeds of Dogs:** In this paper, the student argued that specific breeds of dogs should not be banned because it was not the breed that was bad, but the owner. She looked at the banning from the perspective of people who loved dogs, people who feared them, police protection of citizens, and bad dog owners.

Critical Thinking / Outcome Expectations

You will need a “real world” audience and forum for this paper. To whom and where you write are completely up to you, but, be aware that your audience should be specific and not too general. Audiences described as “everyone” or “women” or “men from 16-30” are not specific enough. Your audience must coincide with your forum and be specific. As discussed, your forum decisions will affect your paper in several ways from how you use your voice to how much of the story you choose to convey. Do not take these considerations lightly.

English 102 - Research Unit

Criteria

1. The research unit will consist of two parts; the proposal that will be turned in separately and the research paper that is part of your final in this class.
2. Research Paper 6-8 pgs.
3. Times New Roman 12 point font, default (1.25) margins, double-spaced.
4. Minimum use of five sources. You must use MLA or APA documentation in-text and include a works cited page.
5. Must go through the Drafting and Peer Response Process
6. Cover Sheet should include: name, date, unit, title, thesis, purpose and audience.

Assignment

Your Research Paper has been designed to (among other things) help you: establish a structured and developed argument, practice finding sources of information by authorities on a subject, establish adequate note-taking techniques, insure you are capable of properly blending source material to support your ideas/opinions, and verify you are capable of using proper documentation style. Thus, your Research Paper is an argumentative essay that integrates (synthesizes) information from other sources with your ideas. You will be arguing a thesis involving your topic. You will be evaluating the material you have researched and leading your reader toward a considered opinion or conclusion. Your introduction should present your thesis and set your tone. The body of the research paper should set out the points (in topic sentences) that prove/illustrate your thesis, and develop those points. Your research will support and develop these ideas. Your conclusion should wrap up your argument for your audience.

This paper should have an arguable thesis. You must use your synthesis skills and properly document your sources. DO NOT just locate five sources and dump all the information together. The purpose of this assignment has always been to read about and research a topic extensively; selecting what is and is not important to your thesis. Sources should be reputable for your topic choice. Authorities should be appropriate and credible. You should work to blend sources within the paper to support your argument.

Don't forget to acknowledge both the pros and cons of your particular subject. In order to argue your case effectively, you need to know what objections might be raised about your thesis - then you can go about refuting them. Remember, you must acknowledge and rebut counterarguments. Don't be afraid to contradict or argue with the "authorities." YOU are the expert for your paper. As long as you *back up* your opinions or propositions with convincing reasons and supporting evidence, don't worry about taking on the "heavyweights." As ever, use the material, don't let it use you! You don't want the paper to be a bunch of quotations and paraphrases strung together with only a few of your own ideas and sentences. Instead, keep your ideas at the center, and use the evidence to build your case.

Topic:

You are free to pick your subject, though it should be academic in nature and focused and limited enough for a 6-8 page paper. The first four papers should have helped you narrow down your topic and the structure you would like to use for your argument. You can use the freewriting prompts below to explore topics. The topic that you choose could be the topic you have been working on through your position paper and annotated bibliography, or you may choose something else.

Freewriting Prompts:

1. Relate your personal experiences/ passions. Think about experiences that you have had in school, life, work and/or society. What do these personal experiences say about culture and society? Consider social issues that effect you and your family. Look at your cultural background, ethnically, socially and/or geographically? How have any of these things effected your experience or lead you in a specific direction?
2. What is your passion in life? What do you feel strongly about? What topic really makes you angry, sad and/or proud? How do you feel about this subject? What can you say that is new about this subject? How is your perspective fresh?
3. Think about local problems in your community, neighborhood or city. Brainstorm issues that you know and care about. How and why do you care about these issues? What do you think? Do the same thing for national and global issues.
4. Look through a newspaper, magazine, news or news channel, what issues are these media outlets reporting and dealing with? Why are they important? What do you think about these issues? Are they important to you? Why? What do you think of the media and how it reports these issues?

Avoid common problems. Due to the complex nature of the research paper, students experience a wide variety of problems during the semester as they compose. The following list depicts many of these potential hazards:

- Chosen topic is too general, too specific, overly researched, etc.
- Utilized source material is out-of-date, not reputable, too scant, etc.
- True argumentative synthesis is lacking;
- Organizational structure is illogical or misleading;
- Information from sources appears as an "information dump";
- Information is organized by source, not by idea;
- Essay lacks development in one or more areas; and
- MLA format is either incorrect or is not utilized.

*Plagiarism: A note on **PLAGIARISM**: Presenting another person's words or ideas as your own is a serious offense. Consult the WVSU Student Code and the English Department policy (given to you with your syllabus) for various policies on plagiarism. In addition, you must pay careful attention to proper methods of paraphrasing, summarizing, and quoting. Look specifically at the guidelines in your text Writing the Research Paper and ask questions.*

Final Thoughts:

The research paper, in addition to the annotated bibliography, is your final in this class. Your research paper is the culmination of all of the work that you have done so far in this class – you should use any of the work that you have already down. For example, your first rough draft could consist of Paper 4 and Paper 3 combined.



Core Graduation Competency: Written Communication Rubric Students will be able to

communicate effectively, orally, in writing and in new media, to a wide variety of audiences. **Written communication** is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum. (Used with Permission by Michigan Technological University.)

Written Communication	What is being assessed	Distinguished 4	Accomplished 3	Emerging 2	Beginning 1
1 Context of and Purpose for Writing	Level of understanding of context, audience (perceptions, expectations, assumptions), and purpose relevant to the writing task(s) and adjustment of writing to address those considerations	Demonstrates a thorough understanding that focuses all elements of the work .	Demonstrates adequate consideration that aligns work to considerations of audience, context, purpose and task.	Demonstrates attention to context, audience, purpose, AND task.	Demonstrates minimal awareness of context, audience, purpose, OR task.
2 Organization and Conventions	Clear and consistent organizational pattern and structuring elements including introduction, thesis and main points, conclusion, and transitions; follows formal and informal rules of genre or disciplinary expectations about organization, content, presentation, formatting, and stylistic choices.	Develops organizational pattern that enhances flow and cohesiveness through the whole work; demonstrates detailed attention to and successful execution of conventions .	Develops adequate organizational pattern that structures the whole work; uses conventions consistently .	Develops recognizable organizational pattern ; follows conventions at a basic level of understanding.	Develops unclear organizational pattern ; shows little awareness of conventions .
3 Content Development	Uses appropriate and relevant content to develop ideas, situate ideas in a disciplinary context, and shape the work	Demonstrates compelling ideas and subject development through the whole work.	Demonstrates appropriate ideas and subject development through the whole work.	Demonstrates simplistic development of ideas and disciplinary context through most of the work.	Demonstrates minimal development of content in some parts of the work.
4 Sources and Evidence	Uses a variety of quality sources and acknowledges different views to support ideas; may use data to support observations and draw conclusions	Demonstrates skillful use of high-quality, credible, diverse, and relevant sources.	Demonstrates consistent use of credible, relevant sources.	Demonstrates inconsistent use of credible and/or relevant sources.	Demonstrates minimal support for ideas in the writing.
5 Control of Syntax and Mechanics	Quality of language use to communicate meaning and control over syntax and mechanics of writing	Shows skillful use of writing to communicate meaning with clarity and fluency .	Shows competent use of writing to clearly convey meaning with minor errors .	Shows understanding of syntax and mechanics. Conveys meaning although may have some errors .	Shows minimal understanding of writing basics. Errors in syntax and mechanics distract from meaning .

Glossary for Written Communication Rubric

5A.1 Context of and Purpose for Writing

Context: the framing situation, conditions, or perspectives for a piece of writing; this may include social, cultural, historical, or technical contexts. The context is what an audience might take into consideration in order to understand the meaning, usefulness, or competence of a piece of writing.

Purpose: the reason for a piece of writing; what the writer sets out to achieve with the writing. This may differ from the stated thesis or argument because the purpose may be generic (to persuade) or dictated by the type of writing. The purpose should be appropriate for the audience and may be shaped by the context. Writers will incorporate sources according to disciplinary and genre conventions, according to the writer's purpose for the text.

Difference between 5A.1 level 1 (“Demonstrates awareness”) and level 2 (“Demonstrates attention”): at level 1, a student may show some recognition of context, purpose, audience, and task but does not adequately respond to them; at level 2, a student attends to context, purpose, audience, and task in rudimentary and minimal ways.

5A.2 Organization and Conventions

Organizational pattern: a systematic arrangement of all aspects of writing; may follow chronological, historical, topical, or other forms of arrangement.

Structuring elements: Parts of a piece of writing that form the basis for an overall pattern; these include the introduction, thesis and main points, conclusion, and transitions.

Disciplinary conventions: Formal and informal rules that constitute what is seen generally as appropriate within different academic fields, e.g. introductory strategies, use of passive voice or first person point of view, expectations for thesis or hypothesis, expectations for kinds of evidence and support that are appropriate to the task at hand, use of primary and secondary sources to provide evidence and support arguments and to document critical perspectives on the topic.

Genre conventions: Formal and informal rules for particular kinds of texts and/or media that guide formatting, organization, and stylistic choices, e.g. lab reports, academic papers, poetry, webpages, or personal essays.

5A.4 Sources and Evidence

Sources: may include a variety of relevant authorities depending on the task and conventions of the writing. Note that sources may be academic or technical but may also include personal experience depending on the nature of the writing.

Evidence: may include a variety of forms including explanations, examples, illustrations, statistics, analogies, and quotations. Evidence may be attributed to a source using a citation but may also include personal narratives and first-hand observations. If the writer does not use citations, there may still be a use of evidence.

5A.5 Control of Syntax and Mechanics

Syntax: the structure or word order of sentences

Mechanics: rules of grammar, spelling and punctuation

J. Oral Communication Assessment

Example Assignment:

The typical Oral Communication Assignment is to give an informative speech.

An informative speech is literally a speech whose aim is to explain or describe facts, truths, or principles. Informative speeches can inform audiences. This speech can be on any one of a large number of topics. Such speeches can be delivered as lectures, briefs, or demonstrations.

Students in Communications 100 are required to develop an informative speech (5-7 minutes in length) and present either in person or via video if online. Students are also required to submit an outline with this presentation. Topics are to be pre-approved by the instructor. Informative speeches can be assessed using the Oral Communication Value [Rubric](#).

DRAFT

Oral Communication Value Rubric

Oral Communication is prepared, purposeful presentation designed to increase knowledge, to foster understanding or to promote change in the listener's attitudes, values, beliefs, or behaviors.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Organization	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable and is skillful and makes the content of the presentation cohesive.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is clearly and consistently observable within the presentation.	Organizational patterns (specific introduction and conclusion, sequenced material within the body, and transitions) are intermittently observable within the presentation.	Organizational pattern (specific introduction and conclusion, sequenced material within the body, and transitions) is not observable within the presentation.
Language	Language choices are imaginative, memorable, and compelling, and enhance the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are thoughtful and generally support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are mundane and commonplace and partially support the effectiveness of the presentation. Language in presentation is appropriate to audience.	Language choices are unclear and minimally support the effectiveness of the presentation/ Language in presentation is not appropriate to audience.
Delivery	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation compelling and speaker appears polished and confident.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation interesting, and speaker appears comfortable.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) make the presentation understandable and speaker appears tentative.	Delivery techniques (posture, gesture, eye contact, and vocal expressiveness) detract from the understandability of the presentation, and speaker appears uncomfortable.
Supporting Material	A variety of types of supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that significantly supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that generally supports the presentation or establishes the presenter's credibility/authority on the topic.	Supporting materials (explanations, examples, illustration, statistics, analogies, quotations from relevant authorities) make appropriate reference to information or analysis that partially support the presentation or establishes the presenter's credibility/authority on the topic.	Insufficient supporting materials (explanations, examples, illustrations, statistics, analogies, quotations from relevant authorities) make reference to information or analysis that minimally supports the presentation or establishes the presenter's credibility/authority on the topic.
Central Message	Central message is compelling (precisely stated, appropriately repeated, memorable, and strongly supported.)	Central message is clear and consistent with the supporting material.	Central message is basically understandable but is not often repeated and is not memorable.	Central message can be deduced but is not explicitly stated in the presentation.

K. *Multiculturalism and Diversity*

West Virginia State University is a “Living Laboratory of Human Relations,” and multiculturalism and respect for diversity has been core values at WVSU since its inception. Students in the First Year Experience course at WVSU complete diversity assignments to *Demonstrate understanding of multiculturalism and sensitivity to issues of diversity*. A sample assignment is below and the [WVSU Cultural Competency rubric](#) follows on the next page.

Diversity Paper Instructions/Assignment GED 101 – ARH Ladner – Spring 2017

Your assignment is to write a 3-5 page paper on any aspect of diversity (race, gender, religion, orientation, culture/ethnicity) that you feel is significant in human society today.

You should include some information you gather, as well as some discussion/comment, based on your analysis and/or reflection on the topic. You should have at least two sources that are **not** Wikipedia, but these sources can be from the internet or from books/articles. If a source is not from a well-known web or print source, include your evaluation of its reliability and/or have a more mainstream source to back it up and/or contextualize it.

You do NOT need to answer any of the following questions (for yourself or in your paper), but they may be useful in helping you to decide what topics are significant to you.

1. Who are you?
2. What does diversity mean to you?
3. What is your ethnic/racial heritage?
4. Are you clear about your ethnic/racial identity? If yes, why? If no, why not?
5. Who (or what) are the most significant influences in the establishment of your racial/ethnic identity?
6. What experiences have you had with people who you perceive as different to you?
7. As a child, did you have friends who were of a different racial/ethnic background to you? Either way (ie: if your answer was yes or no) how has this influenced the ways in which you view and have interacted with people from other racial/ethnic backgrounds as you have grown up?
8. How were people of different cultures viewed in your family? How were they treated?
9. What messages did you get about people who were "different" from you?
10. What feelings do you experience when writing this paper?
11. Why do you think it's important for students to take a Human Diversity course?
12. What else would you like to add to your reflections here about what diversity means to you?

Questions borrowed from Vaxjo University (Sweden),

<http://www.d.umn.edu/~hrallis/courses/1100sp04/assignments/reflect1.html>

Your paper will be graded on evidence of serious thought about your topic and your selection and/or evaluation of your sources. See the Cultural Competency Rubric for scoring details.

WVSU Cultural Competency Rubric

	Exemplary (4 pts)	Target (3 pts)	Acceptable (2 pts)	Unacceptable (1 pt)	NA
Knowledge of Diversity (Weber State University)	Demonstrates sophisticated understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy or beliefs and practices.	Demonstrates adequate understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy or beliefs and practices.	Demonstrates partial understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy or beliefs and practices.	Demonstrates surface understanding of the complexity of elements important to members of another culture in relation to its history, values, politics, communication styles, economy or beliefs and practices.	
Openness (Weber State University)	Demonstrates evidence of adjustment in own attitudes and beliefs because of working within and learning from diversity and communities and cultures.	Exhibits curiosity about what can be learned from diversity of communities and cultures.	Exhibits little curiosity about what can be learned from diversity of communities and cultures.	Is indifferent or resistant to what can be learned from diversity of communities and cultures.	
Cultural Self-awareness ACTFL	Articulates insights into own cultural rules and biases; can explain how his/her experiences have shaped these rules; can explain how to recognize and/or respond to cultural biases.	Articulates new perspectives about own cultural rules and biases and can express the complexities that new perspectives offer.	Identifies own cultural rules and biases and can identify a few cultural rules and biases of the new culture.	Fails to explain the cultural rules and biases of his/her own cultural group; is unable to identify cultural differences with that of the new culture.	
Cultural Attitudes (Weber State University)	Asks complex questions about other cultures, seeks out and articulates answers to these questions that reflect multiple cultural perspectives.	Asks deep questions about other cultures and seeks out answers to these questions	Asks simple or surface questions about other cultures.	States minimal interest in learning about other cultures.	

IV. APPENDIX A: Additional Examples of Science Labs

Half of a Half Lab Assignment

Pre-lab Half of a Half

Define the following:

Radioactivity:

Transmutation:

Half-life:

Parent atom:

Daughter atom:

Exponential function:

Random Process:

Exponential Decay (decrease):

Print off a five or more sentence summary of the procedure for half of a half using 12 point times roman, 1 inch margins. Note that we will start with 200 pennies and thus 200 pennies is the y-value when the x-value is 0 on your graph.

Half-Life

Half of a Half

Purpose

To develop an understanding of half-life and radioactive decay.

Required Equipment and Supplies

shoe box
200 pennies (or equivalent)
graph paper

Optional

computer
Data Plotter software or equivalent

Discussion

Many things grow at a steady rate, such as population, money in a savings account, and the accumulated thickness of a sheet of paper that is continually folded over onto itself (see Appendix E in *Conceptual Physics*). Many other things decrease at a steady rate, like the value of money in the bank, charge on a discharging capacitor, and the amount of certain materials during radioactive disintegration. A useful way to describe the rate of decrease is in terms of *half life*—the time it takes for the quantity to reduce to half its value. For steady decrease, called "exponential" decrease, the half life stays the same.

Radioactive materials are characterized by their rates of decay and are rated in terms of their half lives. You will explore this idea in this activity.

Procedure

Step 1: Place more than 100 pennies in the shoe box and place the lid on the box. Shake the box for several seconds. Open the box and remove all the pennies head-side up. Count these and record the number in Table A. Do not put the removed pennies back in the box.

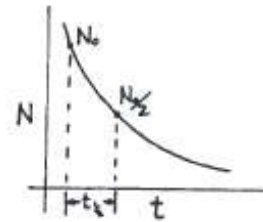
Table A

TOTAL PIECES					
SHAKE NUMBER	NUMBER OF PIECES REMOVED	NUMBER OF PIECES REMAINING	SHAKE NUMBER	NUMBER OF PIECES REMOVED	NUMBER OF PIECES REMAINING

Step 2: Repeat Step 1 until one or no coins remain. Record the number removed each time.

Step 3: Add the total coins removed to find the original number of coins. Now subtract the number of coins removed each time from the total to find the coins remaining after each shake.

Step 4: Now graph the Coins Remaining (vertical axis) vs. Number of Shakes (horizontal axis). Plot the data and draw a smooth line that best fits the points.



Summing Up

1. What is the meaning of the graph you obtained?

2. Approximately what percent of the remaining coins were removed on each shake? Why?

3. Each shake represents a "half-life" for the coins. What is meant by half-life?

Going Further

Plot your data using *Data Plotter*. Try to discover a way to make your graph come out a straight line. Ask your instructor for assistance if you need help.

Instead of using pennies, try using 100 dice and remove dice when all "3's" show up and determine the half-life. Before actually doing this, predict how the half-life compares to the activity of the pennies.

Assessed Questions Half of a Half Lab

1. In this lab, we use the flipping of 200 pennies to simulate radioactive decay. For a radioactive sample in nature, there are many trillions of atoms undergoing radioactive decay. In the case of natural samples, what fraction of atoms will remain after one half-life? Write a mathematical expression(s) or describe in words (diagram) how you would relate the fraction of radioactive atoms remaining to the number of half-lives that have elapsed in natural samples.

2. If you start out with one radioactive atom, what is the probability that the radioactive atom will remain after three half-lives? Write a mathematical expression(s) or describe in words (diagram) how to determine the probability of a radioactive atom remaining without decay after, n half-lives.

Tracking Mars Lab

Pre-Lab: Tracking Mars

Print off a half page summary of the procedure for tracking Mars using 12 pt times roman, 1 inch margins. This ½ page does not include your name, date, class or any other extraneous information. If you include any or all of this information put it on one line.

Define or answer question before lab:

Foci (as used in mathematics):

Locus (as used in mathematics):

Ellipse:

Eccentricity (as used in mathematics):

Major axis:

Minor axis:

Semi-major axis:

Kepler's first law:

Opposition (as used in this lab handout):

Perihelion:

Aphelion:

Geocentric:

Heliocentric:

What would the Greek's (Aristotle) predict to be the shape (geometry) of Mars' orbit?

For how long did Tyco Brahe collect data?

What is the length of a Martian year in Earth days?

CONCEPTUAL PHYSICAL SCIENCE**Activity****The Solar System****A Planetary Puzzle**

Tracking Mars

Purpose

To plot the orbit of Mars employing the technique of Johannes Kepler and the data obtained by Tycho Brahe four centuries ago

Apparatus

four sheets of plain grid graph paper
ruler

compass
sharp pencil

protractor

Discussion

In the early 1500s, the Polish astronomer Nicolaus Copernicus used observations and geometry to determine the orbital radius and orbital period for the planets known at the time. Copernicus based his work on the revolutionary assumption that the planets moved around the Sun. In the late 1500s, before telescopes were invented, the Danish astronomer Tycho Brahe made 20 years of extensive and accurate measurements of planets and bright stars. Near the end of Tycho's career, he hired a young German mathematician, Johannes Kepler, who was assigned the task of plotting the orbit of Mars using Tycho Brahe's data.



Kepler started by drawing a circle to represent Earth's orbit (not bad, considering that Earth's orbit only approximates a circle, which he did not know at the time). Since Mars takes 687 Earth days to orbit the Sun once, Kepler paid attention to observations that were exactly 687 days apart. In this way, Mars would be in the same place while Earth would be in a different location. Two angular readings of the location of Mars, from the same location on Earth 687 days apart, were all that was needed—where the two lines crossed was a point on the orbit of Mars. Plotting many such points did not trace out a circle, as Kepler had expected—rather, the path was an ellipse. Kepler was the first to discover that if the planets orbited the Sun, they did so in elliptical rather than circular paths. He then went on to plot a better orbit for Earth based on observations of the Sun, and further refined the plotted orbit of Mars.

In this activity, you will duplicate the work of Kepler, simplifying somewhat by assuming a circular orbit for Earth—it turns out the difference is minor, and the elliptical path of Mars is evident. From Brahe's extensive tables, we will use only the data shown in Table A.

Procedure

Step 1: You will want a sheet of graph paper with about a 14 × 14-inch working area. If need be, tape two legal-size sheets of borderless graph paper together, or four regular 8 1/2" × 11" sheets.

Step 2: Make a dot at the center of your paper to represent the Sun. Place a compass there, and draw a 10-cm-radius circle to represent the orbit of Earth around the Sun. Draw a light line from the center to the right of the paper, and mark the intersection with Earth's orbit 0°. This is the position of Earth on September 21. All your plotting will be counterclockwise around the circle from this reference point.

Table A. Brahe's data are grouped in 14 pairs of Mars sightings. For the first 9 pairs, the first line of data is for Mars in opposition—when Sun, Earth, and Mars were on the same line—when Mars was 90° to the Earth horizon, directly overhead at midnight. The second line of data are positions measured 687 days later, when Mars was again in the same place in its orbit, and Earth in a different place, where a different angle was then measured. All angles given in the table read from a 0° reference line—the line from the Sun to Earth at the autumnal equinox, September 21. Mars at points 10–14 are non-opposition sightings. The first line of Point 10, for example, shows that when Earth was at 277° , Mars was seen not directly overhead, but at 208.5° with respect to the 0° reference line. Then, 687 days later, Earth was at 235° , and Mars was seen at 272.5° . The data are neatly arranged for plotting—something that took Kepler years to do.

Step 3: Locate the first point in Mars's orbit, Point 1, from Table A. Do this by first marking with a protractor the position of Earth along the circle for the date November 28, 1580. This is 66.5° above the 0° reference line. Draw a dot to show Earth's position at this time.

Mars Orbit Point	Date			Earth Position (Ecliptic)	Mars Position (Ecliptic)
	Mo	Day	Year		
1	11	28	1580	66.5	66.5
	10	16	1582	22.5	107
2	1	7	1583	107	107
	11	24	1584	62.5	144
3	2	10	1585	141.5	141.5
	12	29	1586	97.5	177
4	3	16	1587	175.5	175.5
	1	31	1589	132	212
5	4	24	1589	214.5	214.5
	3	12	1591	171.5	253.5
6	6	18	1591	266.5	266.5
	5	5	1593	225	311
7	9	5	1593	342.5	342.5
	7	24	1595	300.5	29.5
8	11	10	1595	47.5	47.5
	9	27	1597	4	90
9	12	24	1597	92.5	92.5
	11	11	1599	48	130.5
10	6	29	1589	277	208.5
	5	16	1591	235	272.5
11	8	1	1591	308	260.5
	6	18	1593	266.5	335
12	9	9	1591	345.5	273
	7	27	1593	304	347.5
13	10	3	1593	9.5	337.5
	8	20	1595	327	44.5
14	11	23	1593	60.5	350.5
	10	10	1595	17	56

Step 4: Mars at this time was in *opposition*—opposite to the Sun in the sky. A line from the Sun to Earth at this time extends radially outward to Mars. Draw a line from the center of your circle (the Sun) to Earth's position at this time, and beyond Earth through Mars. Where is Mars along this line? You will need another sighting of Mars 687 days later, when Mars is at the same place and Earth is at another.

Step 5: If you were to add 687 days to November 28, 1580, you would get October 16, 1582. At that date, Mars was measured to be lower in the sky—actually 107.0° with respect to the 0° reference line of September 21. With respect to the reference line, use a protractor and ruler and draw a line at 107.0° as shown in Figure 1. Where your two lines intersect is a point along the orbit of Mars.

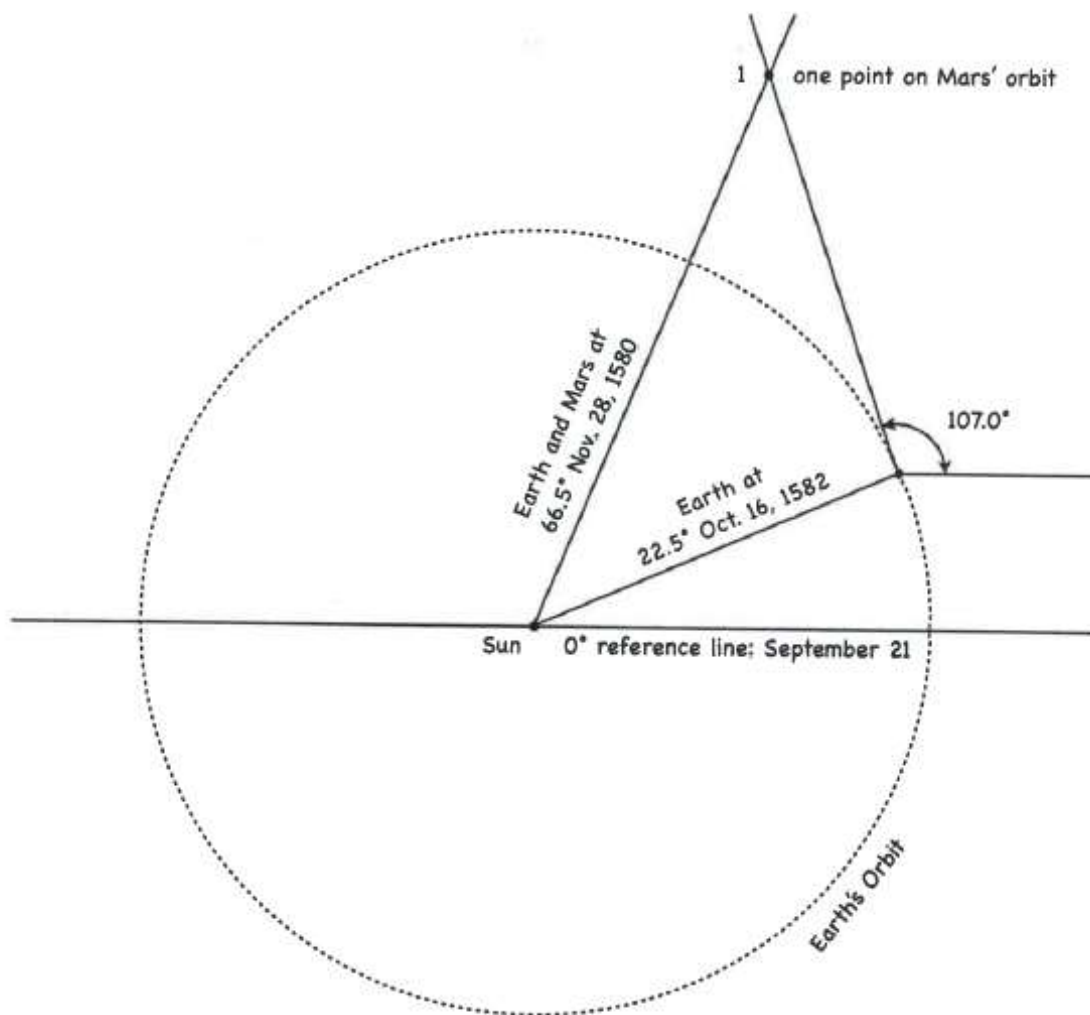


Figure 1. Your plot should look like this for finding Mars' Orbit Point 1; data are in the first pair of lines of Table A. Angles from Earth to Mars are given with respect to the 0° reference line of September 21.

Step 6: With care, plot the 13 other intersections that represent points along the orbit of Mars, using the data in Table A.

Step 7: Connect your points, either very carefully by freehand or with a French curve.

Bravo—you have plotted the orbit of Mars using Kepler's method from four centuries ago!

Summing Up

1. Place the point of your compass on the position of the Sun and place the pencil on the first point of the plotted orbit of Mars. Draw a circular orbit with that radius. Does that circle match the orbit of Mars? If not, describe the differences.
2. Does the plot agree with Kepler's finding that the orbit is an ellipse?
3. During what month are the orbits of Mars and Earth closest?
4. Will the month where the orbits of Mars and Earth are closest always be the same? Explain your answer.
5. Describe or draw a picture of what the Greeks thought the orbit of Mars should look like. Does your plot of the orbit of Mars confirm or falsify the Greeks proposed orbit?
6. Did Tyco Brahe live long enough to make plotting Mars' orbit easy?
7. What assumption is made about the orbit of Earth to construct the orbit of Mars?
8. Is this assumption reasonable (hint: consult your textbook or google eccentricities of the planets)?
9. Locate perihelion and aphelion on the orbit of Mars you constructed.

Mid Ocean Ridge Lab

Pre-Lab Mid Ocean Ridge

For Lab 1 – Paleomagnetism in the handout, do activities 1-8 and 10. Then do exercises 2.4 – 2.7 in the lab book (Ludman & Marshak, pg. 33-39). When you have done this, answer the prediction question on the next page and then do lab 3 – Heat Flow, in this handout. To answer questions 14 and 15 in Lab 3, use the results from exercises 2.4 -2.7. After completing the lab, write down whether your prediction was confirmed or falsified.

Define:

Paleomagnetism:

Normal Polarity:

Reversed Polarity:

Positive anomaly (as it applies to this lab, see page 3):

Negative anomaly (as it applies to this lab, see page 3):

Magnetic Stripes:

(tx) Sea-Floor Spreading:

(lc) Geomagnetic Time Scale:

Magnetic Curves (as it applies to this lab, see page 3):

Magnetic Epochs (as it applies to this lab, see page 4):

Magnetic Events (as it applies to this lab, see page 4):

(tx) Mid-ocean Ridge:

(lc) Rift (as used in geology):

Describe the age-versus depth relationship for ocean topography:

Prediction: After completing Lab 1 and exercises 2.4-2-7 in Ludman and Marshak (p. 33-39) predict whether the mid-Atlantic Ridge or the East Pacific Rise would have the higher heat flow? Explain, what physical principles and observations in the plate tectonics labs (Subduction Zone Lab Set, Transform Fault Lab Set and Mid-Ocean Ridge Lab Set) led you to make this prediction?

PLATE TECTONICS

⑦

MID-OCEAN RIDGE LAB SET



LAVA FLOWS IN THE MID-ATLANTIC RIFT

— Woods Hole Oceanographic Institution

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MID-OCEAN RIDGE LAB SET

Lab 1 — Paleomagnetism

INTRODUCTION

As molten lava cools, its iron minerals line up in the direction of the Earth's magnetic field. As early as 1906 it was noticed that some rocks were magnetized in the opposite direction — as if the Earth's north and south magnetic poles had switched places. Now it is known that the poles have flipped many times during the geologic past creating periods of normal magnetism, as today, and periods when the magnetic field was reversed.

In 1963 it was proposed that new oceanic crust is created at the mid-ocean ridges by lava upwelling from the interior in a process called sea-floor spreading. If so, the rocks of a mid-ocean ridge should preserve a record of the periods of normal and reversed magnetism. If we measure the strength of the Earth's magnetic field across the ridge, a series of anomalies or differences should occur. Where rocks that solidified during normal magnetism are found, there should be high values because the magnetism induced in them should add to the current field strength. Where rocks that solidified during reversed magnetism are found, there should be low values because these reduce the local effect of the Earth's present magnetic field.

When the magnetic anomalies are mapped, alternating bands of high and low magnetism should appear along both sides of the ridge. Such a pattern would provide strong evidence that sea-floor spreading is the process that forms ocean basins and moves continents.

OBJECTIVES

When you complete this lab exercise you should be able to:

1. construct and interpret a map based on paleomagnetic data.
2. recognize the role of the anomalous paleomagnetic data.
3. describe a rift and what happens there.
4. understand how the theory of sea-floor spreading was verified.
5. explain a means of dating volcanic rocks.

MATERIALS

Outline map on transparent paper of the mid-ocean ridge in the Pacific Ocean with four vessel tracks across it; magnetic curves; Geomagnetic Time Scale.

PROCEDURE

On page 3 there are four curves marked V-1, V-2, V-3 and V-4 that indicate the magnetic field strength across a section of the mid-ocean ridge in the Pacific. When the curve is above zero, a positive anomaly, it indicates the rocks of the ocean floor were formed during a time of normal magnetism. When the curve drops below zero, a negative anomaly, the rocks were formed when the field was reversed.

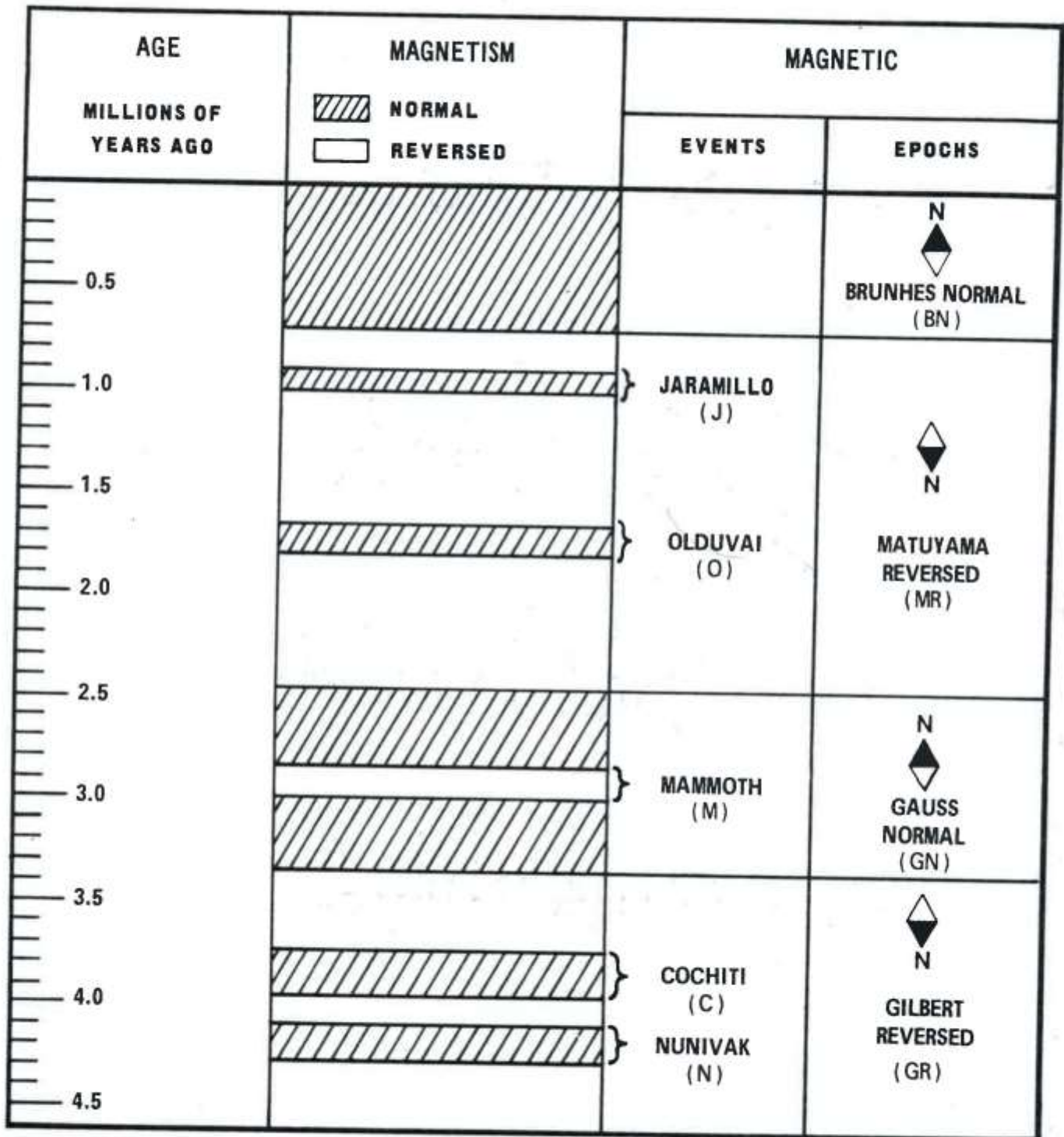
1. On the outline map are the tracks of the vessels which recorded the four curves. Place the map over the curves so track V-1 lines up with its corresponding set of curves. Make sure the point where the ridge axis crosses the vessel track corresponds also. On track V-1 mark off the points where curve V-1 intersects the line of 0 field strength. Start at the ridge axis and work outward both ways. These points are the divisions between normal and reversed magnetism. Repeat this procedure for tracks V-2, V-3 and V-4.
2. Connect the track V-1 points to the corresponding points on track V-2, and then to those of tracks V-3 and V-4. Place a + sign between the pair of points bounding each positive anomaly. Shade in the area of each positive anomaly.
3. Complete the Student Work Sheet on page 5.

MAGNETIC CURVES

RIDGE
AXIS



GEOMAGNETIC TIME SCALE



There are two types of magnetic time periods: Magnetic events and magnetic epochs. Magnetic events are short term, from 10,000 to 200,000 years. Magnetic epochs are longer, from 900,000 to 1.8 million years, and may contain several magnetic events.

Name _____

Lab 1 — Paleomagnetism

Student Work Sheet

1. Circle the statement that best describes the appearance of the magnetic anomalies on your map: scattered points, rounded forms, stripes, wavy line.
2. Circle each of the statements that describes the arrangement of the anomalies on the map: no apparent order, cut across axis, parallel to axis, similar on opposite sides of axis, very different on opposite sides of axis, positive and negative alternate.
3. Write a sentence using the circled statements in 1 and 2 above which describes the pattern of magnetic anomalies associated with the mid-ocean ridge.

4. Which band of rock is the youngest? _____

5. How do you know that? _____

6. Where are the oldest bands of rock? _____

7. Does the pattern of magnetic anomalies across the mid-ocean ridge support the sea-floor spreading hypothesis? _____

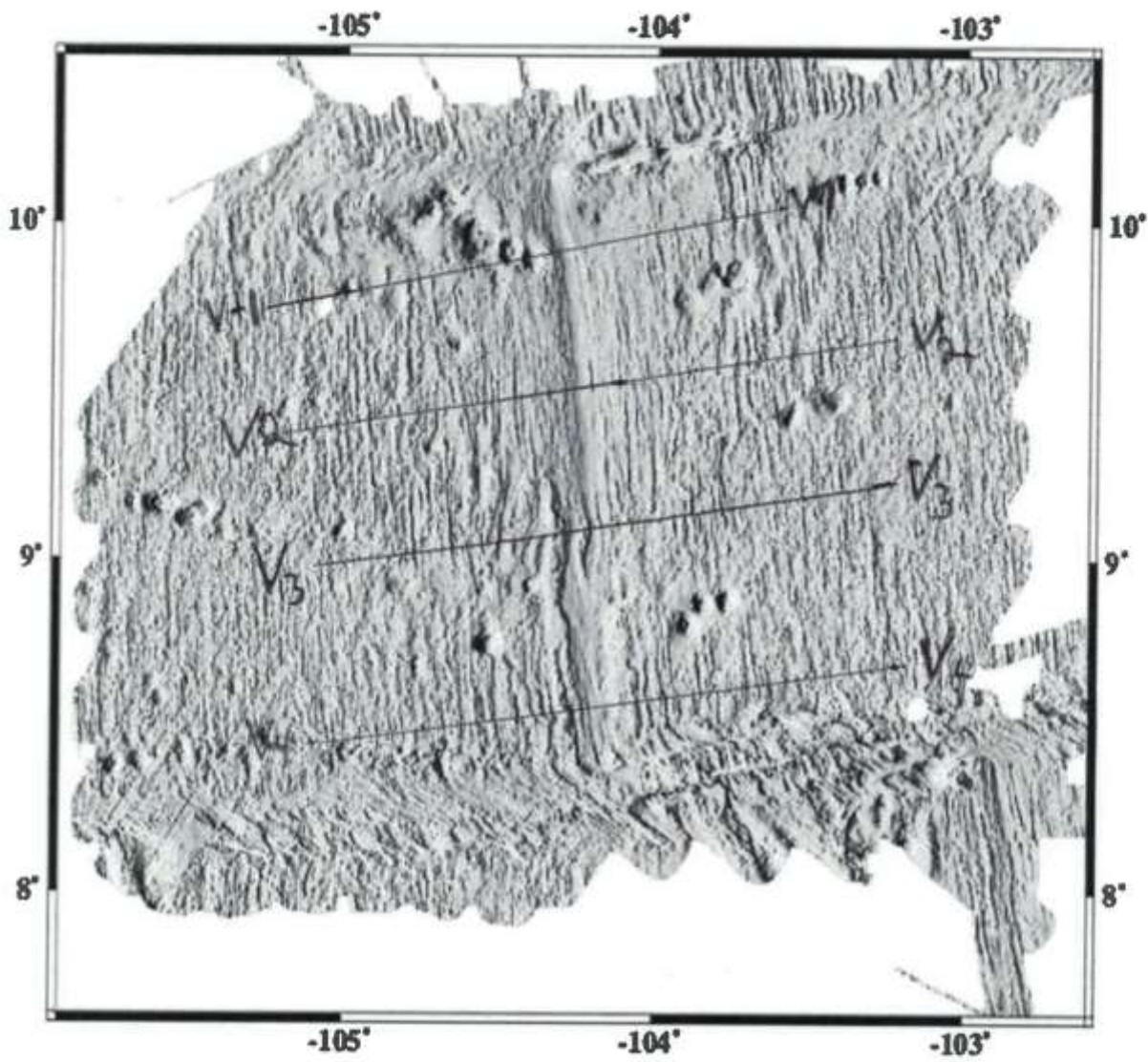
Explain your answer. _____

ADVANCED ACTIVITIES

8. Using the Geomagnetic Time Scale on page 4 identify each band on your map by its abbreviation.
9. Using the map scale to find the distance and the time durations on the Geomagnetic Time Scale, calculate the average spreading rate for the past 3 million years in the Pacific Ocean.

10. Do magnetic reversals occur at regular intervals through time? _____

NE Pacific - LDEO Ridge Multibeam



1
 $111 \text{ km/deg} \Rightarrow 1 \text{ mm} = 2.62 \text{ km}$

EXERCISE 2.2 Geographic Evidence for Plate Tectonics

Name: _____
Course: _____

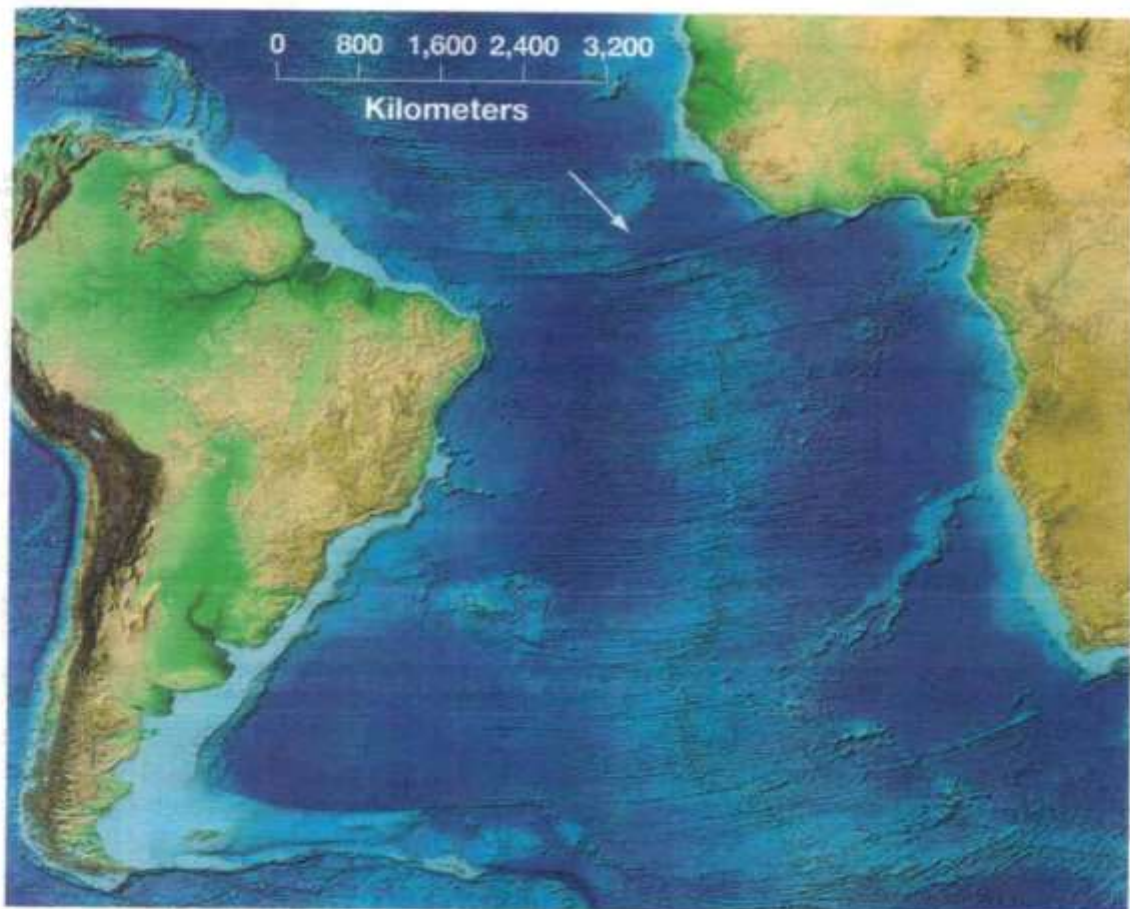
Section: _____
Date: _____

In this exercise, you will examine the shorelines of South America and Africa for evidence of the theory of plate tectonics.

- (a) Sketch the shorelines of South America and Africa from the figure below on separate pieces of tracing paper. Rearrange the continents so that they fit as well as possible without overlapping or leaving large gaps. How well do the continents fit? Where are the problem areas?

- (b) Are the current shorelines of South America and Africa accurate representations of those continents when they were rifted apart? What factors other than rifting and seafloor spreading could have modified the shape of the current shorelines?

Physiographic map of the South Atlantic Ocean floor and adjacent continents.



(continued)

2.4 Modern Evidence for Plate Tectonics

The geographic fit and paleoclimate evidence convinced some geologists that plate tectonics was a reasonable hypothesis, but more information was needed to convince the rest. That evidence came from an improved understanding of Earth's magnetic field, the ability to date ocean-floor rocks, careful examination of earthquake waves, and direct measurements of plate motion using global positioning satellites and other exciting new technologies. The full body of evidence has converted nearly all doubters to ardent supporters.

2.4.1 Evidence for Seafloor Spreading: Oceanic Magnetic Anomalies

Earth has a magnetic field that can be thought of as having "north" and "south" poles like a bar magnet (FIG. 2.6). Navigational compasses are aligned by magnetic lines of force that emanate from one pole and reenter the Earth at the other. The magnetic field has been known for centuries, but two discoveries about the field in the mid-twentieth century provided new insights about how the field works and, soon afterward, the evidence that confirmed the plate tectonic theory.

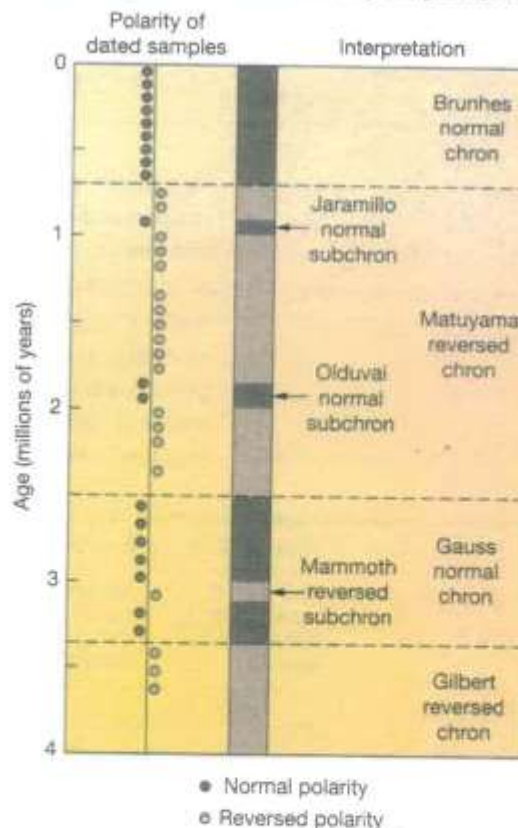
First, geologists learned that when grains of magnetite or hematite crystallize, they are aligned magnetically parallel to Earth's lines of force. Some rocks that contain magnetite or hematite therefore preserve a weak record of Earth's ancient magnetic field, a record called **paleomagnetism**. Then geologists learned that the magnetic field reverses polarity from time to time, so that what is now the north magnetic pole becomes the south magnetic pole and vice versa. During periods of **normal polarity**, the field is the same as it is today, but during periods of **reversed polarity**, a compass needle that points to today's north magnetic pole would swing around and point south. So by finding and determining the polarities of rocks throughout the world, geologists have accurately learned the dates of the magnetic reversals back to 4.0 Ma (FIG. 2.7).

This was interesting and certainly surprising, but how does it support plate tectonics? Earth's magnetic field varies irregularly on the continents, with a complex pattern of areas where the field is anomalously stronger or weaker than average (positive and negative **magnetic anomalies**). In contrast, research in the late 1960s discovered that the pattern of magnetic anomalies in the oceans is much simpler and more regular than that on the continents—parallel linear belts of positive and negative anomalies

FIGURE 2.6 Earth's magnetic field is defined by magnetic lines of force shown by the arrows.

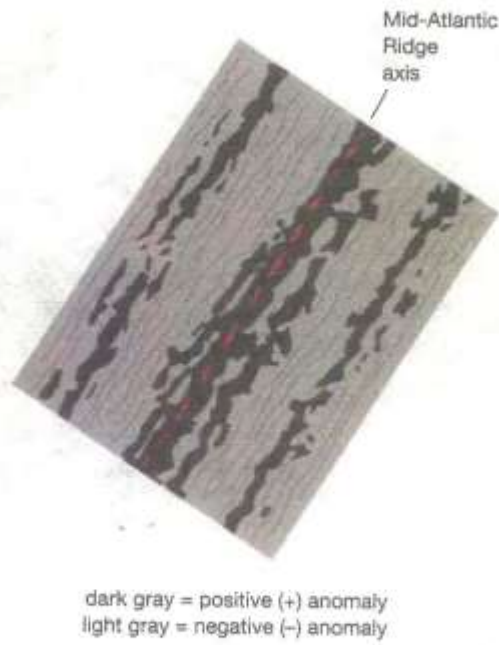


FIGURE 2.7 Radiometric dating of lava flows shows magnetic reversals for only the past 4 Ma.

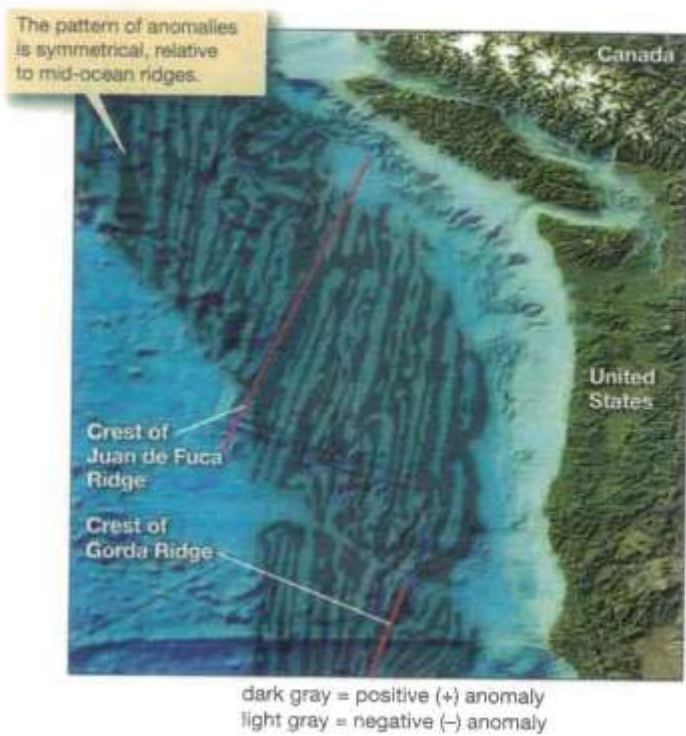


Major intervals of positive or negative polarity are called *chrons* and are named after scientists who contributed to the understanding of the magnetic field. Short-duration reversals are called *subchrons*.

FIGURE 2.8 Magnetic anomaly stripes in the Atlantic and Pacific oceans.



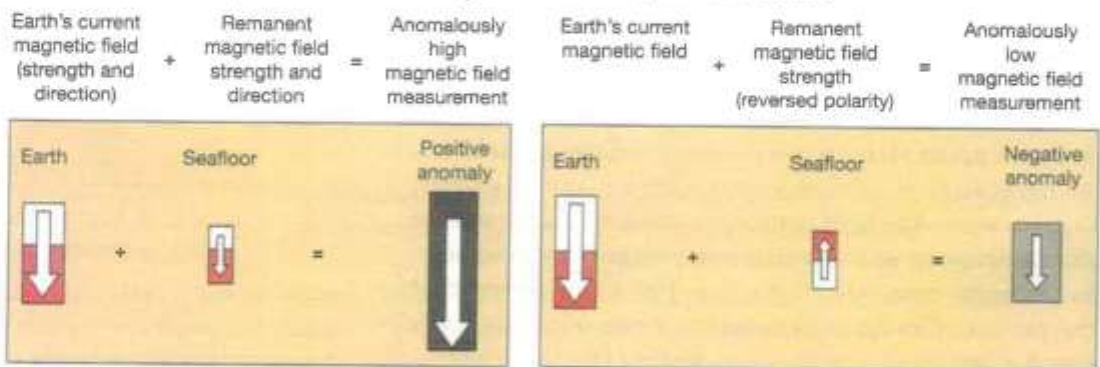
(a) The Mid-Atlantic Ridge southwest of Iceland.



(b) The Juan de Fuca and Gorda ridges in the North Pacific off the state of Washington and the province of British Columbia.

informally called **magnetic stripes** (FIG. 2.8a, b). The measured strength of the magnetic field in the oceans is the result of two components: (1) Earth's modern magnetic field strength and (2) the paleomagnetism (remanent magnetic field) of the oceanic crust. If the paleomagnetic polarity of a rock is the same as today's magnetic field, the rock's weak paleomagnetism *adds* to the modern field strength, resulting in an observed magnetic field *stronger* than today's field. If the paleomagnetic polarity is reversed, the rock's paleomagnetism *subtracts* from the modern field, and the result is a measurement *weaker* than the average modern magnetic field (FIG. 2.9).

FIGURE 2.9 Components of Earth's magnetic field strength in the oceans.



This pattern of reversals has been found at every oceanic ridge, proving that the reversals are truly worldwide events, and this paleomagnetism was convincing evidence for seafloor spreading. As lava erupting at ocean ridges cools, it records the magnetic field polarity in effect at that time. If Earth's polarity reverses, new lava will adopt the new polarity, and the older lava will yield a negative magnetic anomaly as shown in Figure 2.9.

Using this information, Exercise 2.4 shows the reasoning by which geologists connected magnetic anomaly stripes in the oceans with the plate tectonic model.

EXERCISE 2.4 Interpreting Ocean Ridge Magnetic Stripes

Name: _____ Section: _____
Course: _____ Date: _____

In Figure 2.8a, compare the orientation of the magnetic anomaly stripes for the Mid-Atlantic Ridge with the orientation of the ridge crest (illustrated with a red line.) In Figure 2.8b, do the same for the Juan de Fuca Ridge and its anomalies.

(a) Are the individual anomalies oriented randomly? Are they parallel to the ridge crests? Oblique to the ridge crests?

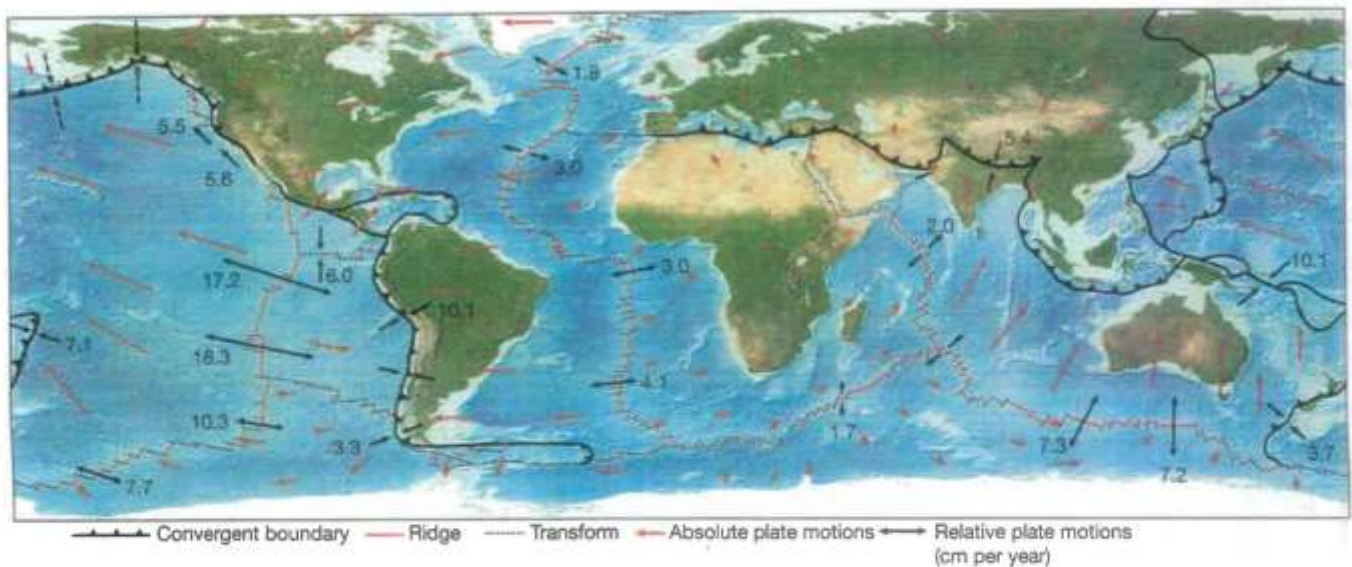
(b) Explain how the process of seafloor spreading can produce these orientations and relationships.

(c) Some magnetic stripes are wider than others. Knowing what you do about seafloor spreading and magnetic reversals, suggest an explanation.

2.4.2 Direct Measurement of Plate Motion

Skeptics can no longer argue that Earth's major features are fixed in place. Satellite instruments can measure Earth's features with precision not even dreamed of 10 years ago, and they make it possible to measure the directions and rates of plate motion. Data for the major plates are shown in FIG 2.10. The length of each arrow indicates the relative rate of plate motion caused by seafloor spreading. We will see later how geologists were able to deduce the same information using other data.

FIGURE 2.10 Rates of motion of Earth's major plates measured by satellite instruments.



2.5 Processes at Plate Boundaries Revealed in Earth Features

The next few exercises examine the three kinds of plate boundaries and show how geologists deduce details of their geometry, the rates of plate motion involved, and their histories. Let's start with information that we can gather about seafloor spreading.

EXERCISE 2.5 Estimating Seafloor Spreading Rates

Name: _____
 Course: _____

Section: _____
 Date: _____

The South Atlantic Ocean formed by seafloor spreading at the Mid-Atlantic Ridge. Geologists can get a rough estimate of the spreading rate (i.e., the relative motion of South America with respect to Africa) by measuring the distance between the two continents in a direction parallel to the fracture zones and determining the time over which the spreading occurred.

- (a) Measure the distance between South America and Africa along the fracture zone (indicated by the arrow) on the map in Exercise 2.2 (see p.29) _____ km

The oldest rocks in the South Atlantic Ocean, immediately adjacent to the African and South American continental shelves, are 120,000,000 years old.

- (b) Calculate the average rate of seafloor spreading for the South Atlantic Ocean over its entire existence. Express your answer in _____ km/million years = _____ km/yr = _____ cm/yr = _____ mm/yr.
- (c) Assuming someone born today lives to the age of 100, how much wider will the Atlantic Ocean become during his or her lifetime? _____ cm

2.5.1 Seafloor Spreading and Continental Rifting

These results dramatically demonstrate how slowly the South Atlantic Ocean is spreading and why plate tectonics met widespread disbelief initially. They also reinforce the importance of understanding the vast expanse of geologic time discussed in Chapter 1. Even extremely slow processes can have great impact given enough time to operate!

A new ocean forms when rifting takes place beneath a continent. The continental crust first thins and then breaks into two pieces separated by an oceanic ridge. As seafloor spreading proceeds, an ocean basin grows between the fragments of the original continent. This process is in an early stage today in eastern Africa.

Exercises 2.6, 2.7, and 2.8 examine these concepts and processes further.

EXERCISE 2.6

Comparing Seafloor Spreading Rates of Different Ocean Ridges

Name: _____
Course: _____

Section: _____
Date: _____

Magnetic reversals are found worldwide, so magnetic stripes should be the same width in every ocean if the rate of seafloor spreading is the same at all ridges. If a particular anomaly is wider in one ocean than another, however, it must result from faster spreading. The figure on the right shows simplified magnetic stripes from the South Atlantic and Pacific oceans, the ages of the rocks, and the distance from the spreading center (the red line). For simplicity, only the most recent 80 million years of data are shown for the two oceans, and we will only estimate the spreading rate for that time span.

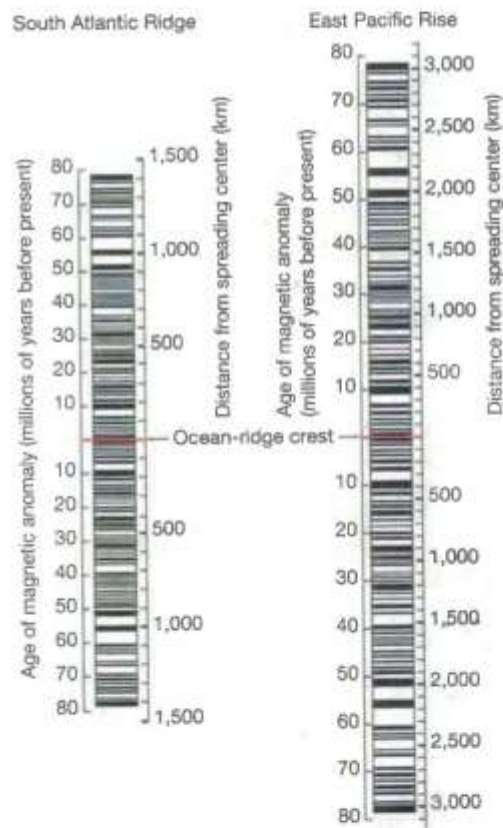
- Measure the width of the South Atlantic Ocean _____ km
- Estimate the average rate at which the South Atlantic Ridge has been opening over the 80 million years for which data are provided. _____ cm/yr.
- Now look at the data for the South Pacific Ocean and its spreading center, the East Pacific Rise. Considering the width of this ocean, will the spreading rate be the same, greater, or less than that of the South Atlantic? _____ Explain.

- Now get the details. Measure the width of the South Pacific Ocean. _____ km

- What is the spreading rate of the East Pacific Rise? _____ $\frac{\text{km}}{\text{million years}}$
_____ $\frac{\text{cm}}{\text{yr}}$

These spreading rates are typical of the range measured throughout the world's oceans and represent "fast spreaders" and "slow spreaders."

Map view of magnetic anomaly stripes in two oceans.



(red line = axis of ocean ridges; black = positive anomaly; white = negative anomaly)

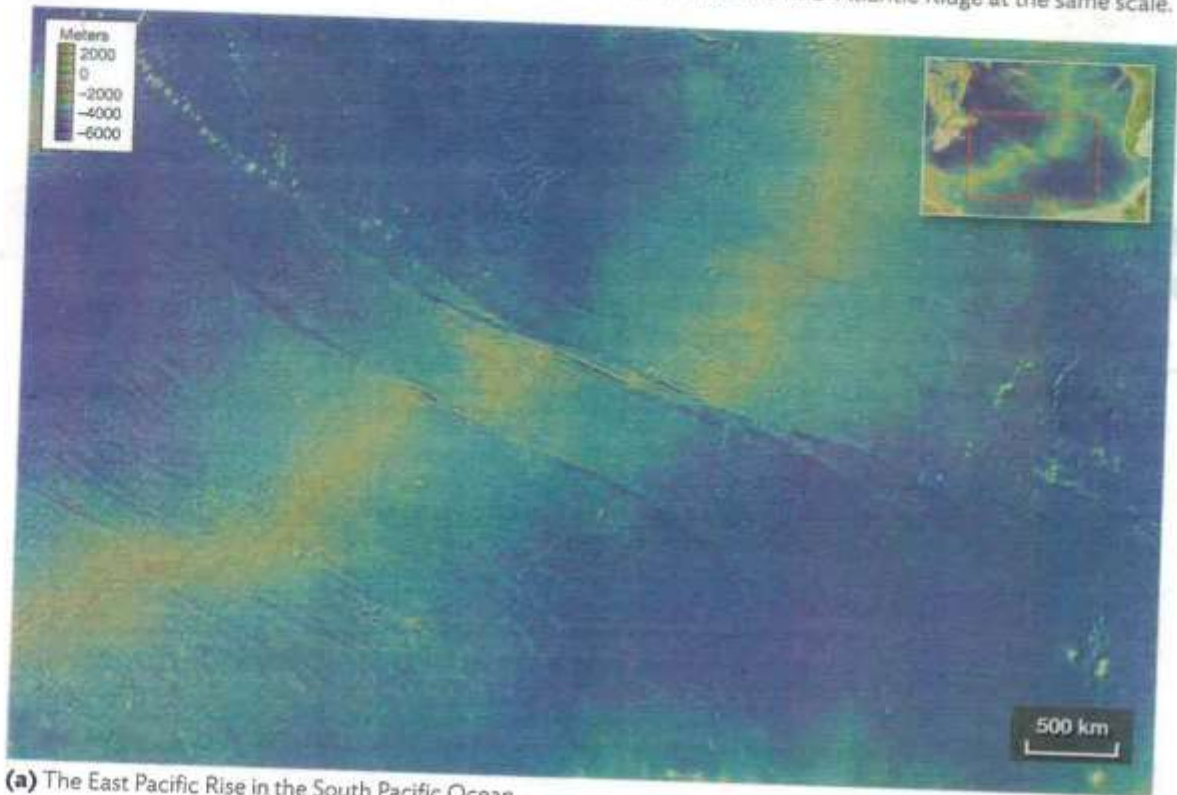
EXERCISE 2.7

A Tale of Two Ridges

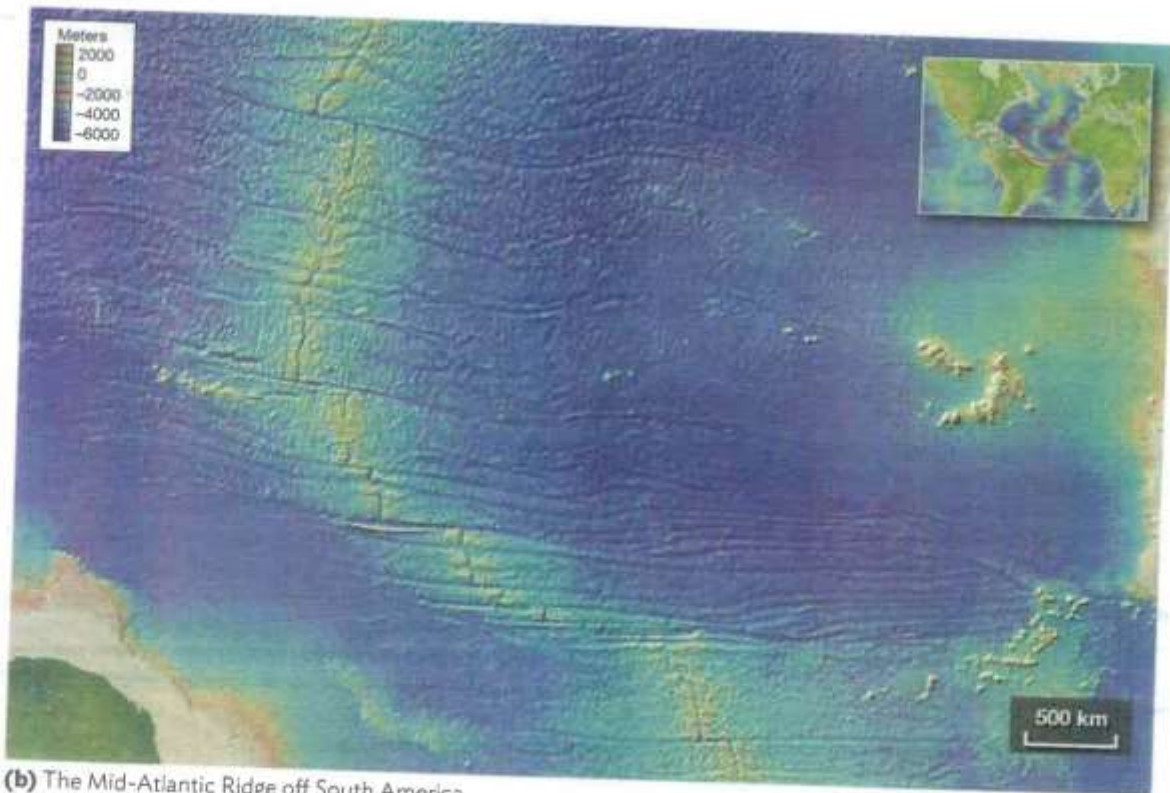
Name: _____
Course: _____

Section: _____
Date: _____

The figures below show bathymetric maps of parts of the East Pacific Rise and Mid-Atlantic Ridge at the same scale.



(a) The East Pacific Rise in the South Pacific Ocean.



(b) The Mid-Atlantic Ridge off South America.

(continued)

EXERCISE 2.7 A Tale of Two Ridges (continued)

Name: _____
Course: _____

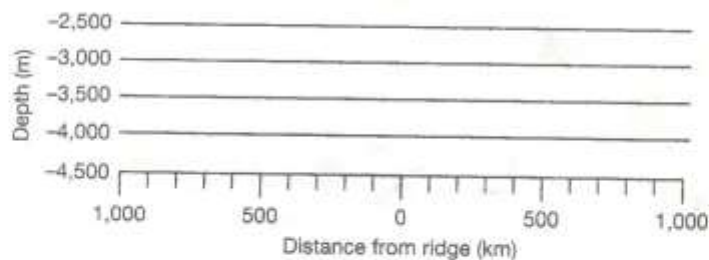
Section: _____
Date: _____

- (a) Ocean ridges typically have a rift valley at their axes—a valley created when two continents split. Which of the two ridges in the previous figures has the deepest and longest rift valley?

Different spreading rates cause variations in shape because of the way the cooling lithosphere behaves. Lithosphere near the ridge axis is young, thin, still hot, and therefore has a lower density than older, colder lithosphere far from the axis. As a result, the ridge axis area floats relatively high on the underlying asthenosphere, and the water above it is relatively shallow. As seafloor spreading moves the oceanic lithosphere away from the ridge axis, the rocks cool and get thicker and denser. The farther it is from the ridge axis, the lower the oceanic lithosphere sits on the asthenosphere and the deeper the water will be. This concept is known as the **age-versus-depth relationship**.

- (b) Keeping in mind the age-versus-depth relationship, why is the belt of shallow sea wider over the East Pacific Rise than over the Mid-Atlantic Ridge?

- (c) On the graph provided, plot depth (on the vertical axis) against distance from the ridge axis (on the horizontal axis) for both the East Pacific Rise and the Mid-Atlantic Ridge. Use five to ten points for each ridge, marking the points you use on the maps on page 38. Connect the dots for the East Pacific Rise with red pencil and those for the Mid-Atlantic Ridge with green pencil to make cross sections of each ridge.



- (d) Does the rate at which the depth increases with distance from the ridge stay the same over time, decrease over time, or increase over time?

Lab 3 — Heat Flow

INTRODUCTION

The Earth is a hot planet. In certain areas water is heated to its boiling point by hot rock just below the surface. Pressure builds up and a geyser of hot steam and water erupts. Volcanoes, spewing out molten rock and steam, also give direct evidence of internal heat. The temperature of molten lava is about $1,200^{\circ}\text{C}$. Indirect evidence indicates that temperatures in the Earth's core approach $2,500^{\circ}\text{C}$. — hot enough to melt iron!

Even in areas far from volcanic action there is a small but measurable flow of heat from the interior to the surface. Most of this heat is generated by the disintegration of radioactive elements in the lithosphere and mantle.

The escape of heat through the Earth's surface, called heat flow, can be measured at the ocean floor by thrusting a device with two thermometers into the bottom sediments. After a period of time the lower thermometer will register a higher temperature than the upper one. The difference between the two readings determines the amount of heat flow which is a very low value, the average being 1.2 millionths of a calorie per square centimeter of surface area each second.

In this exercise you will construct a heat flow map to determine if there are any relationships between major geographic features and heat flow.

OBJECTIVES

When you complete the exercise for Lab 3 you should be able to:

1. construct and interpret a heat flow map.
2. recognize the variation in heat flow over the Earth's surface.
3. discuss the data that does not support a theory.
4. understand the possible role of the Earth's internal heat in the formation of ocean basins.

MATERIALS

Outline map of the Atlantic Ocean with latitude/longitude grid; Table of heat flow values for 5° squares of the Atlantic Ocean; Four colored pencils: red, yellow, green and blue; Outline map and table of heat flow values for the East Pacific Rise.

PROCEDURE

1. From the table on page 12 plot the heat flow values on the map by placing the appropriate number in the square bounded by the latitude and longitude given. Note that there are squares for which no data is available.
2. Color the squares using this color code to make any relationships more apparent.

Heat Flow Values	Color
3.0 and higher	red
2.0 to 2.9	yellow
1.0 to 1.9	green
0.0 to 0.9	blue

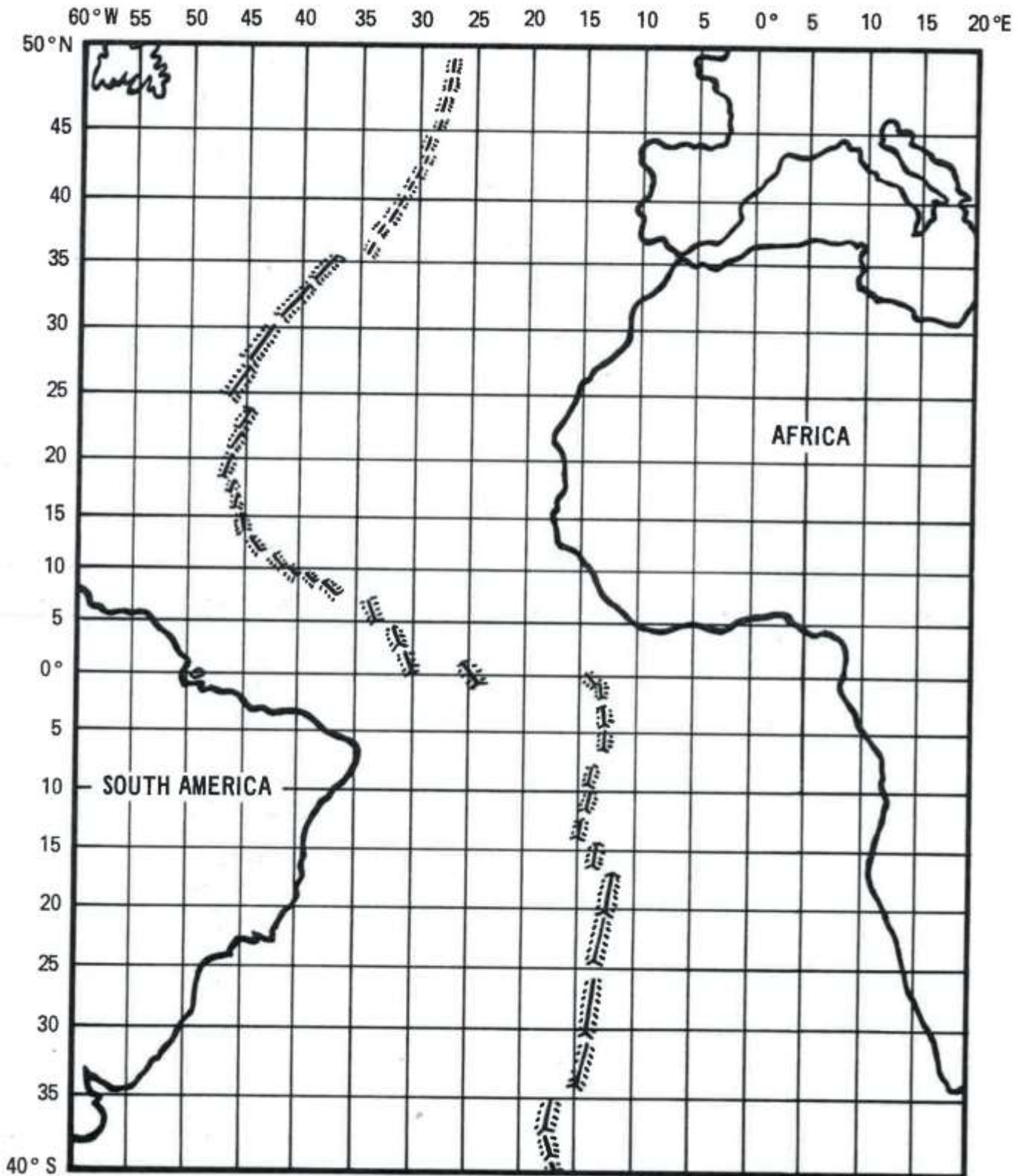
3. Complete the Student Work Sheets on pages 15 and 16.

HEAT FLOW IN THE ATLANTIC OCEAN BASIN

Latitude	Longitude	Value	Latitude	Longitude	Value
45-50 N	30W-25W	6.7	00-05 N	45W-40W	1.2
	25W-20W	1.3		40W-35W	1.9
	20W-15W	0.9		35W-30W	1.6
	15W-10W	1.1		20W-15W	1.5
	10W-05W	0.8		15W-10W	1.2
40-45 N	20W-15W	1.2	10W-05W	1.4	
	15W-10W	1.1	05W-00	1.5	
35-40 N	60W-55W	1.5	05S-00	00-05E	1.4
	25W-20W	1.1		40W-35W	1.6
	20W-15W	1.1		35W-30W	1.9
30-35 N	15W-10W	1.1	15W-10W	1.0	
	60W-55W	0.8	10W-05W	1.2	
	50W-45W	1.2	00-05E	1.4	
	20W-15W	0.6	05E-10E	1.5	
	15W-10W	1.0	5-10 S	35W-30W	1.3
10W-05W	1.0	20W-15W		0.3	
25-30 N	60W-55W	0.9	15W-10W	0.9	
	55W-50W	1.0	00-05E	1.4	
	50W-45W	0.7	05E-10E	1.7	
	45W-40W	0.8	10-15 S	35W-30W	1.5
	40W-35W	2.5		30W-25W	0.6
	35W-30W	0.7		25W-20W	1.5
	30W-25W	1.2	20W-15W	0.4	
	25W-20W	1.1	00-05E	1.5	
20W-15W	1.0	15-20 S	35W-30W	1.4	
20-25 N	60W-55W		0.6	30W-25W	1.3
	50W-45W		2.6	25W-20W	0.6
	45W-40W		1.8	20W-15W	1.1
	40W-35W	0.6	15W-10W	1.7	
	35W-30W	1.4	05E-10E	1.3	
15-20 N	60W-55W	0.9	20-25 S	35W-30W	1.3
	55W-50W	1.4		30W-25W	0.7
	35W-30W	1.3		20W-15W	0.4
10-15 N	60W-55W	1.2	15W-10W	2.8	
	55W-50W	1.2	00-05E	1.4	
	50W-45W	1.4	05E-10E	1.6	
	45W-40W	2.3	25-30S	30W-25W	0.8
	35W-30W	0.8		20W-15W	1.1
30W-25W	1.3	15W-10W		1.5	
05-10 N	45W-40W	1.9	10W-05W	0.7	
	40W-35W	0.8	05W-00	2.2	
	35W-30W	3.1	00-05E	0.8	
	30W-25W	2.0	05E-10E	1.2	
	25W-20W	1.4	30-35 S	25W-20W	1.2
	20W-15W	1.2		15W-10W	2.1
	15W-10W	1.6		10W-05W	2.3
				05W-00	0.9
		00-05E		1.5	
		05E-10E	1.3		

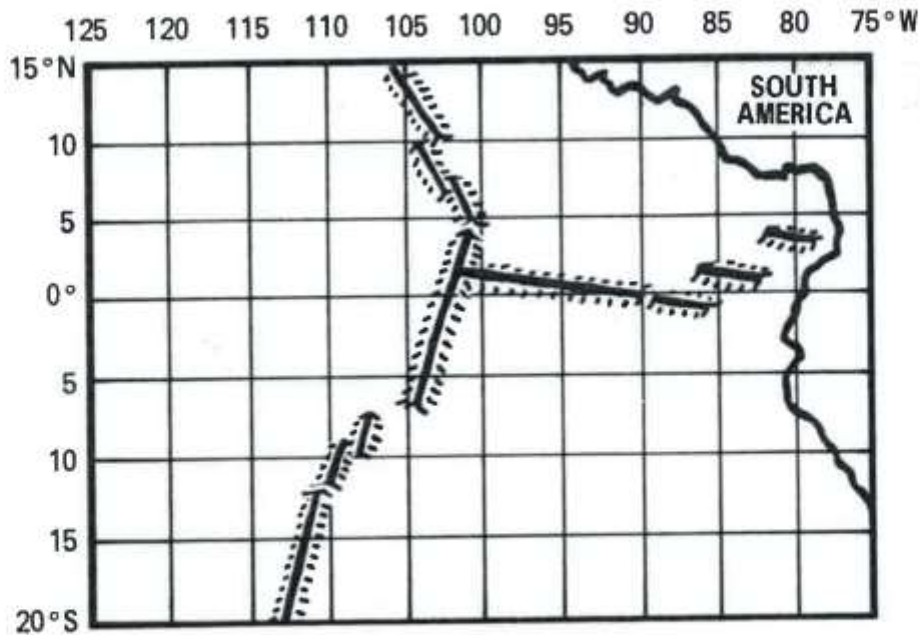
NAME _____

ATLANTIC OCEAN BASIN



MID - OCEAN RIDGE LAB SET
Lab 3 Heat flow map

RIDGE AXIS 



HEAT FLOW NEAR THE EAST PACIFIC RISE

Latitude	Longitude	Value	Latitude	Longitude	Value
15-10N	120W-115W	1.4	00-05 S	120W-115W	1.7
	115W-110W	0.9		115W-110W	0.9
	105W-100W	2.9		110W-105W	0.8
	100W- 95W	1.6		95W- 90W	2.6
	95W- 90W	0.6		90W- 85W	4.2
10-05 N	120W-115W	0.9	05-10 S	85W- 80W	2.1
	115W-110W	1.4		120W-115W	1.5
	110W-105W	3.2	115W-110W	8.0	
	105W-100W	3.5	110W-105W	8.2	
	100W- 95W	0.6	105W-100W	3.2	
	95W- 90W	0.7	100W- 95W	0.4	
	90W- 85W	2.3	95W- 90W	1.2	
	85W- 80W	2.8	85W- 80W	1.0	
05N-00	80W- 75W	2.6	10-15 S	120W-115W	0.4
	120W-115W	1.2		115W-110W	3.3
	115W-110W	0.9		110W-105W	2.6
	110W-105W	2.1		105W-100W	1.4
	105W-100W	2.5	100W- 95W	1.7	
	100W- 95W	1.1	95W- 90W	2.4	
	95W- 90W	0.9	90W- 85W	0.7	
	90W- 85W	0.5	85W- 80W	2.0	
85W- 80W	2.9	15-20 S	120W-115W	1.6	
80W- 75W	6.1		115W-110W	3.2	
			110W-105W	1.4	
			105W-100W	1.8	

MID - OCEAN RIDGE LAB SET

Lab 3 Heat flow map

Name _____

Lab 3 — Heat Flow

Student Work Sheet

Study the heat flow map you have constructed and answer the questions below:

- Are the squares of high heat flow (red and yellow) associated with any geographical feature on your map? _____
If so, name it. _____
- The Mid-Atlantic Ridge is characterized by _____
(relatively high, relatively low, mixed) heat flow values?
- What is the heat flow range at Mid-Atlantic Ridge? _____
- What is the heat flow range in the ocean basin outside of the Mid-Atlantic Ridge? _____
- How does the heat flow map support the sea-floor spreading hypothesis? _____

- How does the heat flow map challenge the sea-floor spreading hypothesis? _____

- Here are the names, locations and ages of oldest lavas for six active volcanoes in the Atlantic. Mark the location of each on your heat flow map with an X.

Ascension	7° S — 14° W, 1 m.y.	Cape Verde Islands	16° N — 24° W, 150 m.y.
Azores	38° N — 28° W, 20 m.y.	St. Paul Rocks	2° N — 29° W, 0.5 m.y.
Canary Islands	28° N — 18° W, 32 m.y.	Tristan da Cunha	37° S — 12° W, 1 m.y.

How many of these volcanoes are associated with the Mid-Atlantic Ridge? _____
- Name those not associated with the Ridge. _____
- How would you describe the distribution of volcanoes in the Atlantic Ocean according to age and distance from the Ridge axis? _____

- Does the volcano distribution support the sea-floor spreading hypothesis? _____
Explain your answer. _____

ADVANCED ACTIVITIES

11. Construct a heat flow map for the East Pacific Rise area based on the table on page 14. In general, are areas of high or low heat flow associated with the East Pacific Rise?
12. Does this heat flow map support the hypothesis that the East Pacific Rise is an area of sea-floor spreading? _____
 Explain your answer. _____

13. Compare this map to the one you made for the Atlantic Basin. Is the pattern of heat flow the same around the mid-ocean ridges? _____
 List any differences. _____

14. a. What spreading rate was found for the East Pacific Rise based on the paleomagnetic data in ~~Lab 1?~~ _____
 Exercise 2.5 & 2.6
 b. What spreading rate was found for the Mid-Atlantic Ridge based on the sediments data in ~~Lab 2?~~ _____
 Exercise 2.5 & 2.6
 c. What is the relationship between spreading rate and heat flow for the two ridges?

15. Based on heat flow and spreading rates which ocean basin do you think has greater volcanic and earthquake activity? _____
 Is this actually the case? _____
 What evidence can you find to support this?

V. APPENDIX B: Meeting Minutes

Meeting Minutes from General Education work sessions

With support from the Provost and Deans, the General education assessment subcommittee chair, along with the Director of Institutional Research, Assessment, and Effectiveness conducted work sessions for faculty teaching General Education courses.

Work Session leaders identified the areas of content included in General Education courses that have been identified by the General Education committee. Deans invited work session leaders to College meetings where faculty were introduced to the assessment development process. At each meeting, representative faculty were asked to schedule a time to meet for three hours at which time two products would be completed by the end of the workshop; 1) A rubric which to use for assessment across their general education courses (all sections) and 2) An example assignment for that rubric. Communications was already piloting the Oral Communication rubric in their Communication 100 courses in order to receive feedback before spring begins so they did not need to have a work session. At these meetings, the current advising worksheet was shared with faculty to discuss the courses already in the general education core which required an assessment rubric and assignment. Below is a copy of the brief PowerPoint delivered at all college meetings during the first step in the process.

**General Education Assessment of Humanities AdHoc Committee
Minutes for Friday, November 4, 2016 Meeting in 210 Cole Complex**

Attendance: Dirk Johnson, Steve Gilliland, Sherri Shafer, Barbara Ladner, Vicky Morris-Dueer, and Brenda Wilson

The meeting was called to order at 9:20 a.m. The purpose of the meeting is to agree upon a rubric to use with assignments in all General Education courses that are in the Humanities General Education Sequence.

HUMANITIES

ART 100: Art Appreciation

COMM 140: Film Appreciation

COMM 140H: Film Appreciation (Honors)

ENGL 150: Introduction to Literature

ENGL 150H: Introduction to Literature (Honors)

MUSC 104: American Music: A Panorama

Discussion & Approval of Rubric:

There was general agreement that Critical Thinking is an important skill to assess in Humanities courses. The group discussed the needs of various courses and key assignments to which a critical thinking rubric might be attached. Following discussion, the group **agreed by consensus to approve the Critical Thinking Rubric attached**. It is adapted from the rubric used by Stephen F. Austin University. The group added to the definitions and made four of the elements required and one element optional.

Conclusion and Adjournment:

The meeting adjourned at 11:00 a.m.

Recorded by Brenda Wilson

**General Education Assessment of Arts AdHoc Committee
Minutes for Friday, November 4, 2016 Meeting in 210 Cole Complex**

Attendance: Susan Marsh Minnerly, Sherri Shafer, Vicky Morris-Dueer, Brenda Vanderford, Brenda Wilson

The meeting was called to order at 9:20 a.m. The purpose of the meeting is to agree upon a rubric to use with assignments in all General Education courses that are in the Arts General Education Sequence.

ARTS

ART 101: Introduction to Art

ART 101H: Introduction to Art (Honors)

COMM 170: Theater Appreciation (formerly titles, The Art of the Theater)

MUSC 107: Appreciation of Music

Discussion & Approval of Rubric:

There was general agreement that Creative Thinking is an important skill to assess in these courses that fall under the Art General Education area. We discussed the COMM 170 and MUSIC 107 courses and key assignments where the Creative thinking rubric would be applicable. The group agreed to the AAC&U Value rubric with one exception; remove the rubric element '*embracing contradictions*' as the group agreed that was not a reasonable expectation in those lower level courses.

We discussed that this rubric be placed in either Livetext or Moodle and Sherrie confirmed from the fee schedule that no extra cost to the student exists for Web30 so this may be a nice way to score the assignment for assessment General Education purposes. This is *not* a requirement nor a final decision, just discussion.

Action: Vicky will clean up rubric and send out to group, Brenda and Susan will offer an assignment that can be easily adapted for use in their courses. We will need to follow-up with Josh. Attached in email is the Creative Thinking rubric.

Conclusion and Adjournment:

The meeting adjourned at 11:00 a.m.
Recorded by Vicky Morris-Dueer

**Ad Hoc Committee for General Education Assessment of History
Minutes for Tuesday, October 11, 2016 Meeting in Hill Hall 127**

Attendance: Billy Jo Peyton, TJ Park, Michael Workman, Vicky Morris-Dueer, and Brenda Wilson

The meeting was called to order by Brenda Wilson at 12:30 p.m.

Brenda explained that the purpose was to select or design an assessment for History General Education Courses that will be flexible enough to meet the needs of all of WVSU's General Education History Courses. (HIST 201, HIST 202, HIST 207 and HIST 208).

After review of several rubrics used by other universities, the committee chose the rubrics used by Winthrop University and Stephen F. Austin State University to adapt for WVSU. During the meeting, the group agreed on four required elements (see rubric attached). After the meeting, Dr. Park suggested that the Communication element be added as an optional element, in case some professors wanted to give students feedback on the level of their communication skill.

Everyone agreed to the attached rubric, which has four required elements and one optional element.

The meeting adjourned at 1:45 p.m.

Record by Brenda Wilson.

**General Education Assessment of International Perspectives Committee
Minutes for Wednesday, October 12, 2016 Meeting in Vicky's Office**

Attendance: Miguel Zapata, Jim Natsis, Carol Susman, Vicky Morris-Dueer, and Brenda Wilson

The meeting was called to order by Brenda Wilson at 8:10 a.m.

Brenda explained that the purpose was to select or design an assessment for International Perspectives that will be flexible enough to meet the needs of all of WVSU's International Perspectives Courses. (COMM 446: International Cinema, INTS 210: Introduction to International Perspectives, INTS 250: Diversity in Africana Studies, ENGL 350: World Literature: Classical Era, ENGL 351: World Literature: Modern Era, ENGL 440: Interpreting the Holocaust, FREN 101: Beginning French, FREN 102: Elementary French, FREN 205: A View of Changing Culture, FREN 443: West African Culture, GERM 101: Beginning German, GERM 102: Elementary German, SPAN 101: Beginning Spanish, SPAN 102: Elementary Spanish, SPAN 205: Spain and its Culture, POSC 210: International Relations, POSC 415: Arab Middle East, PHIL 308: World Religions, EDUC 319: Content Area Literacy, EDUC 321: Teaching Writing in the Elementary School, SOC 308: World Religions, ECON 109, Introduction to World Economy).

Miguel described the rubric that he uses for the ACTFL cultural perspectives standard. Carol described the rubric that she has developed for use in the beginning language courses (101 and 102 level language courses). Brenda described various elements of the AACU VALUE rubrics for Global Learning and Intercultural Knowledge that might be useful. The next few hours were devoted to selecting and revising two Rubrics. The group agreed that there should be two rubrics: 1) the **International Perspectives Rubric** for all International Perspectives courses EXCEPT the beginning language learning courses, and 2) the **Language Learning Rubric** for MFL 101 and 102 courses.

Brenda will send the draft of the International Perspectives Rubric to the committee for final comments. If there are no comments or corrections, she will submit the two rubrics to the General Education committee for their approval.

The meeting adjourned at 10:45 a.m.

**General Education Assessment of Nature of Science and Scientific Thinking AdHoc Committee
Minutes for Thursday, October 6, 2016 Meeting in 002 Hamblin Hall**

Attendance: Kathy Harper, Ernest Sekabunga, Andrew Shedl, Vicky Morris-Dueer, and Brenda Wilson

The meeting was called to order by Brenda Wilson at 4:40 p.m.

Brenda explained that the purpose was to select or design an assessment for Nature of Science and Scientific Thinking and to create assignments attached to each the Science Courses that were grandfathered in as General Education Scientific Thinking or General Education Nature of Science courses. (BIOL 101: Principles of Biology (4 cr.); BIOL 101H: Principles of Biology (Honors) (4 cr.); BIOL 108: Environmental Biology (4 cr.); BIOL 110: Economic Biology (4 cr.); BIOL 120: Fundamentals of Biology (4 cr.); CHEM 100: Consumer Chemistry (3 cr.); CHEM 100H: Consumer Chemistry (Honors) (3 cr.); CHEM 132: Environmental Chemistry (3 cr.); PHYS 101: Physical Science Survey I (3 cr.); PHYS 102: Physical Science Survey II (4 cr.); PHYS 103: Elements of Physical Science (3 cr.); PHYS 106: Introduction to Physical Geology (4 cr.); PHYS 107: Historical Geology (4 cr.); PHYS 110: Weather and Climate (4 cr.); PHYS 111: Energy and the Environment (4 cr.); PHYS 120: Astronomy (3 cr.); PHYS 121: Astronomy Lab (1 cr.))

Discussion ensued on whether to have just one rubric for Nature of Science and Scientific Thinking or to have two rubrics, one for Nature of Science and Scientific Thinking and one for lab procedures, since lab procedures is one of the identified Core Competencies. **The group agreed by consensus that any course that meets the General Education requirement for Nature of Science or Scientific Thinking shall have activities that can be assessed by both the *Nature of Science and Scientific Thinking Rubric* and the *Laboratory Techniques Rubric*.**

The next few hours were devoted to creating two Rubrics: 1) the Nature of Science and Scientific Thinking Rubric, which was designed by selecting parts of the AACU Critical Thinking VALUE Rubric and the AACU Inquiry/Analysis VALUE Rubric and 2) the Laboratory Techniques Rubric. Both are attached.

Faculty agreed to email assignments or activities that are suitable for use with the rubrics (for each General Education Science Course) to Brenda by end of day October 14. Brenda will collect all the assignments and put them into one document to be discussed at the next meeting.

The committee decided to meet again briefly to finalize approval of the two rubrics and to discuss/approve the alignment of the rubrics with suitable assignments or activities specific to each particular General Education Science Course. (Ernie will collect those for Chemistry, Andy those for Physical Science and Kathy those for Biology).

The meeting adjourned at 7 p.m.

NEXT MEETING: October 21, 2016, Hamblin 002, from 4:30-5:30.

**General Education Assessment of Nature of Science and Scientific Thinking AdHoc Committee
Minutes for Thursday, November 3, 2016 Meeting in 002 Hamblin Hall**

Attendance: Kathy Harper, Ernest Sekabunga, Andrew Schedl, Vicky Morris-Dueer, and Brenda Wilson

The meeting was called to order at 4:40 p.m.

The purpose of the meeting is to finalize approval of the two rubrics and examine the alignment of possible assignments with the rubrics.

Alignment of rubrics to assignments:

The meeting began with a discussion of the applicability of the sample assignments collected by Kathy from Biology General Education professors. Andy expressed concern about the lack of scientific consensus on some of the topics of some of the assignments. Brenda said that it is important to let the professor decide on the assignment, as long as the rubric can be applied to the assignment. Kathy said that she was not attached to the assignment topics for which there is lack of scientific consensus. Ernie shared a student's assignment based on student choice of topic. We talked about making sure the assignment instructions were clear enough that students can show that they have talked about observations/evidence, analyzed the evidence and drawn a conclusion based on the analysis.

Approval of Rubrics:

After making some changes to the Laboratory Report Rubric (attached) to clarify and incorporate observations more specifically, **the group agreed by vote (with all in favor) to approve the Laboratory Report Rubric.**

After agreeing on a definition of Critical Thinking in the Natural Sciences, **the group agreed by vote (with all in favor) to approve the Critical Thinking in the Natural Sciences Rubric (attached).**

Conclusion and Adjournment:

We believe that the work of this ad hoc committee to create Natural Science and Scientific Reasoning General Education rubrics is finished.

The meeting adjourned at 5:15 p.m.

Recorded by Brenda Wilson

**General Education Assessment of Social Sciences Ad Hoc Committee
Minutes for Friday, November 4, 2016 Meeting in 119 Hill Hall**

Attendance: Debbie Williams, Frank Vaughn, Pat Wilson, Becky Francis, Paula McCoy, Vicky Morris-Dueer & Brenda Wilson

The meeting was called to order at 1:40 p.m. The purpose of the meeting is to agree upon a rubric to use with assignments in all General Education courses that are in the Social Sciences General Education Sequence.

Discussion & Approval of Rubric:

Faculty talked about assignments that they thought would fit as a good assignment to assess for social sciences. Participants talked about how Ethical self-awareness sometimes devolves to discussions that are not productive. Faculty talked about how to collect the scores on the rubric. Moodle and Livetext were discussed.

Upon examination of the Ethical Reasoning VALUE Rubric, the group decided to remove the word theory and theories from the rubric and replace those words by perspective and perspectives. **Debbie moved and Paula seconded that the 2nd, 3rd, and 4th elements of the AACU Ethical Reasoning VALUE Rubric should be required for use with Social Sciences General Education classes, with the 1st and 5th elements being optional. The agreed upon rubric is attached.** The motion carried without opposition.

Paula volunteered to send to Vicky and Brenda a sample assignment that she plans to use in Psych 151. She is hoping to get it finished by Friday, November 17.

Conclusion and Adjournment:

The meeting adjourned at 2:30 p.m.

Recorded by Brenda Wilson

**General Education Wellness Assessment AdHoc Committee
Minutes for Monday, October 17, 2016 Meeting in 148a Fleming Hall**

Attendance: Aaron Settle, Katie McDilda, Vicky Morris-Dueer, and Brenda Wilson

The meeting was called to order by Vicky Morris-Dueer at 9 a.m. Vicky explained that the purpose was to select or design an assessment for Wellness and to create assignments linked to the assessment.

Discussion ensued about whether the assessment needed to cover all of the Wellness criteria identified by HHP and approved by the General Education Committee:

1. Describe and prioritize each domain of the wellness wheel (Physical, Emotional, Social, Environmental, Spiritual, Intellectual and Financial)
2. Identify signs and symptoms of general medical and sexual-related disease both acute and chronic.
3. Demonstrate the ability to perform exercise that if done consistently will result in a healthier life.
NOTE: if student is disabled or unable to perform exercise (walk, etc.) they will “Identify” rather than demonstrate.
4. Compare and contrast lifestyles based on food/nutritional choices and chronic disease progression.
5. Assess, score and analyze current health and fitness status and develop a plan of improvement.
6. Evaluate the relationship between substance use (including tobacco, smokeless tobacco, alcohol and recreational drugs) and optimal wellness.

We decided by consensus to evaluate criteria 1 and 6. After reviewing several rubrics found online, we rewrote the Sample Rubric for Assessing the Design Elements of a Wellness Action Plan of Stress Management and Physical Activity and Fitness, accessed from <http://course1.winona.edu/shatfield/air/wellnessplans.pdf> on 17 October 2016.

We rewrote the rubric extensively so that it incorporates all seven domains of Wellness and incorporates the idea that students will develop a detailed and functional plan. The rubric is reproduced on the next page.

Aaron remarked that he would be able to explain to the new General Education Wellness instructor how to put an assignment into each of the Wellness courses about ¾ through the course in which students would evaluate their personal Wellness using various measures and then develop a Wellness plan to improve their Wellness scores.

The meeting adjourned at 10:15 a.m.

**General Education Mathematics- Assessment AdHoc Committee
Minutes for Monday, October 13, 2016 Meeting in 830 Wallace Hall**

Attendance: Michael Anderson, Linwei Niu, Ron Baker, Sonya Armstrong, Vicky Morris-Dueer, and Brenda Wilson

The meeting was called to order by Michael Anderson at 12:30 p.m.

Participants reviewed the 16 questions that they had collected for the assessment so far. Suggestions were given for improving the existing questions. Participants decided that they would collect a few more questions and meet again.

We agreed to meet again once we have collected enough questions to finish writing the test. At that meeting, we will finalize the assessment, decide on administration procedures and procedures for scoring (i.e. what scores will indicate that students have reached a satisfactory level for each of the four elements of quantitative literacy being assessed).

The meeting adjourned at 1:45 p.m.

NEXT MEETING: Check your emails for a message from Michael regarding the date, time and place of the next meeting.

**General Education Mathematics- Assessment AdHoc Committee
Minutes for Monday, October 27, 2016 Meeting in 830 Wallace Hall**

Attending: Michael Anderson, Linwei Niu, Ron Baker, and Vicky Dueer

The discussion continued to review the newly suggested items since the previous meeting. Reaffirmed the categories for types of questions:

- Data inference/ data analysis/data mining
- Computation
- Estimation
- Probability
- Logic reasoning/problem solving. Vocabulary

After running through the newly added problems and noting individual thoughts and concerns about wording etc. Michael lead us back through the decision making process of which questions to keep and finalize. The team decided that each category should have four questions for a total of twenty- which was discussed previously. Those are listed as follows;

**Math General Education Questions to
Keep**

Data Inference	Questions 2, 3, 15, 24
Computation	Questions 4, 8, 14, 33
Estimation	Questions 6, 7, 16, 32
Probability	Questions 5, 17, 18, 29
Logic	Questions 28, 19, 21,
Reasoning	25

Of these questions, the following need review before finalizing – rewriting- Questions 14, 17, 24 and adding foils to Question 33

Next meeting to finalize: Thursday 10th, 12:30pm 829 Wallace Hall

Action needed: Revision for questions 14, 17, 24, 33 as specified above

**General Education Mathematics- Assessment AdHoc Committee
Minutes for Monday, November, 15 2016 Meeting in 830 Wallace Hall**

Attendees: Michael Anderson, Ron Baker, Linwei Nui, Sonya Armstrong, Brenda Wilson, Vicky Duerer

Michael called the meeting to order at 12:30 p.m. He stated that he had done some clean up that we discussed at the previous meeting on wording and foils for the exam. He asked others to review that too. It was noted that we have five key areas with four questions each. Some overlap does exist as explained by the committee members that they felt students may need to use data and computation in the same question.

The assessment committee discussed the final step in the process of creating a rubric for quantitative literacy. Michael noted the five categories:

1. Data, represented by questions 1, 2, 9, & 15
2. Computation, represented by questions 3, 7, 8, & 20
3. Estimation, represented by questions 5, 6, 10, and 19
4. Reasoning, represented by questions 13, 14, 16, & 17
5. Probability, represented by questions 4, 11, 12, & 18

During the discussion, Brenda suggested that these could be linked to a rubric with the levels suggested by Sonja: Inchoate, Emerging, Developed, and Mastery. Since there are four problems for each of the five categories, the rubric might look like the one below.

	Mastery	Developed	Emerging	Inchoate
Data	4 out of 4 correct	3 out of 4 correct	2 out of 4 correct	Less than 2 correct
Computation	4 out of 4 correct	3 out of 4 correct	2 out of 4 correct	Less than 2 correct
Estimation	4 out of 4 correct	3 out of 4 correct	2 out of 4 correct	Less than 2 correct
Reasoning	4 out of 4 correct	3 out of 4 correct	2 out of 4 correct	Less than 2 correct
Probability	4 out of 4 correct	3 out of 4 correct	2 out of 4 correct	Less than 2 correct

Math wants to measure at three points: in the beginning, middle, and end of programs. In this way, the assessments will measure growth during the semester in which students take their first math course, and also growth in quantitative reasoning throughout the programs. The proposal is to give the exam in the following courses:

- a. FYE courses- within first month of class

- b. Math 104, 111, 119, and any other course that fulfills the General Education math requirement – toward the end of the course
- c. Senior seminar courses

The group discussed expectations for student scores for each of the points in the programs where students' numeracy is assessed. The group expects that most students will be at the Inchoate or emerging level during FYE; most students will be at Emerging (with a few at Developed) level at the end of their General Education Math Course; and most students will be at the Developed level (with a few at Mastery) at the end of their programs at WVSU.

Michael brought up the need for storage of actual physical general education assessment documents. Where would we house that? Who is responsible for housing? How long do we need to keep the actual hard copy data? In other words, how will General Education maintain an archive system? Vicky noted that we had not addressed that yet in General Education committee meetings or with administration and that there were several aspects of this process that still required attention.

Michael will send an instruction sheet for directions on how the Math and Computer Science departments conduct their assessments and we will adapt that here. Ron asked about whether they should use a more customized scantron form or the general one. We said we would need to address that a little later on.

Next Ron asked about the readability of the graphs in the document since it was prepared in color, but printed in grayscale so Michael will adjust this to use a different symbol instead of color.

Lastly, a question for the General Education committee and administration-if the Math General Education Assessment is to administer the exam at three points in time; at the beginning, middle and end of students' programs, what expectations does the university have for other areas of General Education?

Action is to approve this suggested assessment process forward to the general education committee to review.

Committee adjourned at 1:30 p.m.

**General Education Written Communication Assessment AdHoc Committee
Minutes for Thursday, October 7, 2016 Meeting in 402 Davis Hall**

Attendance: Jessica Barnes- Pietruszynski, Jeff Pietruszynski, Barbara Ladner, Renee Bonnett, Vicky Morris-Dueer, and Brenda Wilson

The meeting was called to order by Brenda Wilson at 10 a.m.

Brenda explained that the purpose was to select or design an assessment for Written Communication and to create assignments linked to the assessment. If we have time, we can talk about the Rubric for the General Education Humanities Course.

After discussion of AACU and MTU written communication rubrics, **Barbara moved that we use the MTU Written Communication, which is a simplification of the AACU Written Communication Rubric. The motion carried with all in favor.** (Brenda and Vicky are non-voting members). This rubric can be applied to almost any writing assignment in English 101 or 102.

Discussion of how to assess: All sections of English 101? Select some students from each section? Randomly select some sections? No decision was made.

Discussion of how to get reliable rubric scores. Decision: we need to train all faculty (including adjuncts) who are scoring English 101 and 102 Essays.

Discussion of using grades from Banner to see if people improve from English 101 to English 102. We decided that grades are problematic in terms of reliability, since so many other factors go into grading, besides skill in written communication. We may do this, because it will be easy to do using Banner data.

Discussion of using the SFA Critical Thinking rubric for the Assessment of Humanities (for General Education Humanities, specifically for the Engl 150 course). After making a few changes in the rubric to make it easier to use, **Barbara moved that we suggest that the Critical Thinking Rubric (attached) be used for the General Education Assessment of Critical Thinking. The motion carried with all in favor.** (Brenda and Vicky are non-voting members). Faculty talked about using the Critical Thinking rubric for any assignment in which students are asked to do a literary critique or an assessment of a literary work. This will work well for English 150.

Brenda will send the minutes and the assessments to the committee.

The meeting adjourned at 12:25 p.m.

The email below states that we have permission to use the MTU modified rubric.

From: **Jeannie DeClerck** <jsdecler@mtu.edu>

Date: Mon, Nov 14, 2016 at 5:17 PM

Subject: Re: Permission to use MTU Written Communication Rubric?

To: Brenda Wilson <wilsonbr@wvstateu.edu>

Cc: Karla Saari Kitalong <kitalong@mtu.edu>, Patricia Sotirin <pjsotiri@mtu.edu>, Jean-Celeste Kampe <kampej@mtu.edu>

Hello, Brenda.

Thank you again for expressing interest in using Michigan Tech's written communication rubric at West Virginia State University. You are welcome use to the updated version of this rubric, which I have attached to this email for your convenience. We have added a citation, indicating that this rubric was adapted from AAC&U VALUE Rubrics.

I've cc'ed the current and past communication goal chairs, who will be pleased to hear that you find this rubric useful.

Best wishes,

Jeannie