

Connecting Africa:

A project-based learning adventure



This series of lessons was designed to meet the needs of gifted children for extension beyond the standard curriculum with the greatest ease of use for the educator. The lessons may be given to the students for individual self-guided work, or they may be taught in a classroom or a home-school setting. Assessment strategies and rubrics are included at the end of each section. The rubrics often include a column for "scholar points," which are invitations for students to extend their efforts beyond that which is required, incorporating creativity or higher level technical skills. The lessons

were developed by Lisa Van Gemert, M.Ed.T., the Mensa Foundation's Youth and Education Ambassador. This lesson was developed in collaboration with Linda Hammon, B.S. Geography, M.Ed., Curriculum and Instruction and Applied Geography, Adjunct Lecturer - Cultural Geography/Geography of Sub-Saharan Africa, Department of Geography, Texas State University - San Marcos.

Introduction

The cradle of civilization and one of the most complex areas on Earth, the continent of Africa is vast both geographically and culturally. A study of the geography and issues of Africa prepare students to better understand its richness and significance. This lesson is designed to give students a fundamental understanding of the physical and human geography of Africa, as well as the opportunity to explore issues facing it.

Guiding Question

- How do human and physical characteristics of Africa influence its economic interdependence?

Learning Objectives

After completing this project, students will be able to:

- Describe elements of the human and physical environment
- Detect errors in reasoning and decide on an alternative
- Construct, support, and defend a position

Product/Performance: Design a new highway route and support it with reasoned argument in the form of:

- Small map of rejected route
- Rationale for rejection of route
- Chart of countries on rejected and proposed routes
- List of countries and capitals on proposed highway
- Magazine cover and article about the region large map showing physical and political places with proposed route
- Memo to World Bank including design and support of new route

Introduction

A conference of African leaders has adopted as its top priority the building of a highway across the continent from Tunis, Tunisia to Cape Town, South Africa. The purpose of the highway is to foster political cooperation among the African nations and to promote economic development, trade, and tourism.

The highway will be financed by the World Bank, which, together with the African leaders, has recently rejected an initial proposal for the highway put forward by a competitor of your company and is now seeking alternate proposals.



You have been asked to submit to the World Bank a proposal for a better route for the highway. You will study a series of maps, data, atlases and other references to explain why the first route was turned down and create a new and improved route with reasoned support for it.

Enclosed is a request for proposal from the World Bank.

Proposal Package:

You will design a new highway route and support it with reasoned argument in the form of:

- Small map of rejected route
- Rationale for rejection of route
- Chart of countries on REJECTED route
- Chart of countries considered for PROPOSED route
- List of countries and capitals on proposed highway (between 13 and 25)
- Magazine cover and article about the region (economics and tourism)
- Large map showing physical and political places with proposed route
- Memo to World Bank including design and support of new route

Each of these components and the corresponding criteria are explained in the applicable section.



Proposal Piece 1a. Analysis of Rejected Route

Enclosed is an outline map of Africa and a list of cities connected by the initial proposal for the transcontinental highway.

Draw the route of the initial proposal on the map and list reasons why you think it was rejected. To help formulate your reasons, consult atlases, lists of construction costs (below), and the purposes of the road. An online atlas is available at <http://www.worldatlas.com>. Additional sources of information include the CIA World Fact Book found at <https://www.cia.gov/library/publications/the-world-factbook> and InfoPlease at <http://www.infoplease.com/atlas>.



Construction Costs: Terrain and climate influence the cost of road construction. Listed below are types of terrain ranked in order of expense for road construction, from most to least expensive:

- mountains
- rainforest/jungle
- desert
- bridge over major rivers
- steppe
- savanna

Roads are more expensive to build in humid, subtropical climates than in Mediterranean climates.

You can find climate zone information at <http://www.blueplanetbiomes.org/climate.htm>.

Draw the rejected route on the map **using this order** of cities:

- | | |
|---|----------------------------------|
| 1. Tunis, Tunisia | 9. Nairobi, Kenya |
| 2. Algiers, Algeria | 10. Dar es Salaam, Tanzania |
| 3. Niamey, Niger | 11. Lilongwe, Malawi |
| 4. Abuja, Nigeria | 12. Lusaka, Zambia |
| 5. Yaounde, Cameroon | 13. Harare, Zimbabwe |
| 6. Brazzaville, Congo | 14. Johannesburg, South Africa |
| 7. Kinshasa, Democratic Republic of the Congo | 15. Port Elizabeth, South Africa |
| 8. Kampala, Uganda | 16. Cape Town, South Africa |

Map of rejected route



Map courtesy of worldatlas.com

Proposal Piece 1b. Rationale for Route Rejection

Using the atlases and other rationale, state three reasons that the World Bank and African leaders might have rejected the proposed highway. Include specific data you obtained and note the sources. Keep in mind the purpose of the construction of the highway:

- Encourage economic development and trade among countries
- Promote tourism
- Promote political and economic cooperation between countries
- Stimulate economic development
- Develop a transportation system

Probable Reasons for rejection of the initial proposal:

1. Physical Geographic Reasons:

2. Human Geographic Reasons:

3. Other Factors:

1A. SMALL MAP OF REJECTED ROUTE RUBRIC

CATEGORY	SCHOLAR POINTS AVAILABLE	5	4	3	2	1
Completeness	Additional landmarks or geographic attributes notes.	Everything is completed.	Most items completed (fewer than 5 missing).	Most items completed (fewer than 10 missing).	Missing 10-15 items.	Incomplete.
Accuracy	Locations noted with latitude/longitude.	Everything is located accurately. Spelling correct.	Most items located accurately. 1-5 off. Most spelling correct.	Location not sure on 6-10. Spelling unsure.	10 or more items out of place. Poor spelling.	Incomplete.
Presentation	Added unexpected or creative dimensionality.	Exceptional color/orderliness/legibility. Ink labels.	Good color/orderliness/legibility. Ink & pencil labels.	Satisfactory color/orderliness/legibility. Pencil labels.	Poor color/orderliness/legibility. Incomplete labels.	Incomplete. No color. No labels.
SCORE: ____/15						

1B. RATIONALE OF REJECTED ROUTE RUBRIC

CATEGORY	SCHOLAR POINTS AVAILABLE	5	4	3	2	1
Completeness	Identified additional considerations that demonstrated complex reasoning.	Everything completed.	Most items completed.	Most items completed.	Missing nearly everything.	Incomplete.
Quality of Analysis	Found and utilized additional quality sources of information.	Clear evidence of superior reasoning using geographic knowledge.	Clear evidence of adequate reasoning using geographic knowledge.	Some evidence of reasoning using geographic knowledge.	Little evidence of reasoning using geographic knowledge.	Incomplete.
SCORE: ____/15						

Proposal Piece 2. Information about the Routes

Now, you will complete analytical charts of the countries include in the rejected and proposed routes. Using the templates below, note the important elements in each category for the country listed.

PROPOSAL PIECE 2A. CHART OF REJECTED ROUTE						
Country	Physical characteristics	Cultural characteristics	Economic features	Hazards	Other factors that might affect highway	Relations with other countries
Tunisia						
Algiers						
Niger						
Nigeria						
Cameroon						
Congo						

PROPOSAL PIECE 2A. CHART OF REJECTED ROUTE

Country	Physical characteristics	Cultural characteristics	Economic features	Hazards	Other factors that might affect highway	Relations with other countries
Uganda						
Kenya						
Tanzania						
Malawi						
Zimbabwe						
South Africa						

Additional notes/facts of interest or influence:

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Proposal Piece 2b. Chart of Proposed Route

The chart on the next page will form the basis of your choices for countries through which to plan your proposed route. Remember that you may have countries on this chart that you do not end up choosing. Print as many copies of the chart page as necessary for your analysis. You may have duplication of countries from the previous chart.

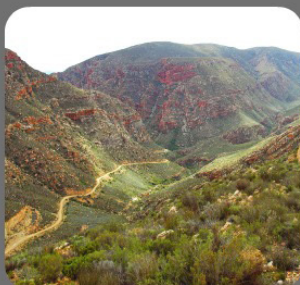
After you have completed the chart, use the following criteria to analyze the countries for inclusion in your proposal.

The route must

- Cover a major portion of the continent
- Connect major population centers
- Cross a minimum of 13 countries and a maximum of 25
- Pass through at least one capital city on the Atlantic Ocean and one capital city on the Indian Ocean

Think about

- Topography (control construction costs)
- Climate (try to avoid harsh areas)
- Environment (build where it would cause the least damage)
- Location of natural resources (What will you need to build and how will you get it there?)
- Location of major/capital cities (ensure contact with highest number of people)
- Tourist attractions (infusion of foreign capital, improve balance of trade)
- Political considerations (War? Refugees?)
- Health issues (tsetse fly, dengue fever, AIDS, Ebola – avoid where possible)



PROPOSAL PIECE 2B. CHART OF PROPOSED ROUTE

Country	Physical characteristics	Cultural characteristics	Economic features	Hazards	Other factors that might affect highway	Relations with other countries

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Proposal Piece 2c. List of Countries/Capitals Connected by Proposed Hightay in Order

1. _____

14. _____

2. _____

15. _____

3. _____

16. _____

4. _____

17. _____

5. _____

18. _____

6. _____

19. _____

7. _____

20. _____

8. _____

21. _____

9. _____

22. _____

10. _____

23. _____

11. _____

24. _____

12. _____

25. _____

13. _____

2A. CHART OF REJECTED ROUTE

CATEGORY	SCHOLAR POINTS AVAILABLE	4	3	2	1	Score
Organization and layout	Strong consistency and evenness throughout chart.	Good organization, and data are logical and easy to follow.	Organized; data for the most part are clear.	Some organization; data slightly unclear.	Not organized; data make no sense and are not clear.	
Quality and accuracy of information	The research quality of the information exceeds the expectation, including pertinent, yet uncommon, facts.	Information is very specific to process and accurate.	Information is not completely relevant to process and chart contains a few inaccuracies.	Information is somewhat ambiguous and/or somewhat inaccurate.	Unable to find specific details and/or details are mostly inaccurate.	
Presentation	Although the information is the same, it is not presented with the chart but rather in a creative or unusual way.	Exceptional color/orderliness/legibility. Ink labels.	Good color/orderliness/legibility. Ink & pencil labels.	Inadequate use of chart; somewhat confusing.	Confusing and untidy.	
SCORE: ____/12						

2B. CHART OF PROPOSED ROUTE

CATEGORY	SCHOLAR POINTS AVAILABLE	4	3	2	1	Score
Organization and layout	Strong consistency and evenness throughout chart.	Good organization, and data are logical and easy to follow.	Organized; data for the most part are clear.	Some organization; data slightly unclear.	Not organized; data make no sense and are not clear.	
Quality and accuracy of information	The research quality of the information exceeds the expectation, including pertinent, yet uncommon, facts.	Information is very specific to process and accurate.	Information is not completely relevant to process and chart contains a few inaccuracies.	Information is somewhat ambiguous and/or somewhat inaccurate.	Unable to find specific details and/or details are mostly inaccurate.	
Presentation	Although the information is the same, it is not presented with the chart but rather in a creative or unusual way.	Exceptional color/orderliness/legibility. Ink labels.	Good color/orderliness/legibility. Ink & pencil labels.	Inadequate use of chart; somewhat confusing.	Confusing and untidy.	
						SCORE: ____/12

2C. LIST OF COUNTRIES ON PROPOSED ROUTE

____ 4 points Between 13 and 25 countries
 ____ 1 point Correct spelling
 ____ 3 points Correct order
 ____ 4 points Matches map
 ____ **Total / 12**

Proposal Piece 3. Magazine — Issues in Africa

You will design a magazine cover and write an article about an issue in Africa that includes a possible solution.

Proposal Piece 3a. Magazine cover

You will use bighugelabs.com/magazine.php to create the cover.

- Select an original title for the magazine.
- Select a title for the cover story.
- Select an image about the issue you selected. Be sure to use an image in Creative Commons at search.creativecommons.org. Do not use copyrighted material.
- Include the price of the magazine (put the amount in an African currency).
- Include the date of the magazine.
- The cover should be neat, attractive and colorful.
- You may wish to have titles of additional articles on the cover.

Proposal Piece 3b. Magazine Article

Select ONE of the following issues in Africa (there may be others — if you are interested in an issue you don't see here, you may choose another).

- | | |
|---------------------------------|-------------------------|
| ▶ Lasting effects of apartheid | ▶ Low life expectancy |
| ▶ Endangered animals (poaching) | ▶ Refugees |
| ▶ Illiteracy | ▶ Poverty |
| ▶ Civil war | ▶ Starvation and famine |
| ▶ Disease (AIDS, malaria, etc.) | ▶ Genocide |

- Discuss the issue in Africa that was selected for the cover story.
- Be sure to include why it is an important issue and how it has affected the people, a country, or the continent.
- Be sure to include solutions to help solve the issue.
- The title of the article is the cover story (see step 3a above).
- Write the article using the same format that you would find in a magazine. It will need to be at least one page with two columns. You may illustrate your article, but make sure you cite your source and make sure that you add the extra text to make up for it (pictures don't count toward the length of the article). Don't forget your byline (the author who wrote the article).

3A. MAGAZINE COVER

CATEGORY	SCHOLAR POINTS AVAILABLE	4	3	2	1	Score
Cover illustration	Unusual or self-created in an effective way.	Image is appropriate, attractive and not a copyrighted image.	Image is appropriate and not copyrighted.	Image is satisfactory and not copyrighted.	Image is unrelated to topic, of poor quality or copyrighted.	
Story title	Cover story title includes historical, literary or geographical allusion.	Compelling title that corresponds with cover image.	Satisfactory title that corresponds with cover image.	Common-place title, lacking in any particular significance.	Ineffective selection of cover story title.	
Magazine title	Magazine title is clever or intellectually provocative.	Title is appropriate in selection and length and effective, evocative or interesting.	Title is appropriate and satisfactory.	Title is mundane, without thought or appropriateness.	Ineffective title.	
Additional components	Additional article titles or other added features contribute to a polished, professional look.	Price is in an African currency and is reasonable. The date is visible.	Price is in African currency. The date is visible.	Price not in African currency. Date difficult to read.	Missing one or more elements.	
						SCORE: ____/12

3B. MAGAZINE ARTICLE

____ 10 points What is the issue?	____ 5 points Correctly formatted (two columns with byline)
____ 25 points Why is it an issue?	____ 10 points Correct length (at least one page)
____ 25 points How has it affected the people/country/continent?	____ 10 points Writing style/grammar/syntax
____ 15 points What is a possible solution to the problem?	____ Total / 100

Proposal Piece 4. Large Map of Proposed Route

The map should

- Be at least ½ of a poster board
- Be well-colored, neat, and attractive in appearance
- Appropriately convey the route
- Contain a legend
- Be accurate and easy to interpret
- Be labeled well (spelling counts)

Considerations for your route:

The route must

- Cover a major portion of the continent
- Connect major population centers
- Cross a minimum of 13 countries and a maximum of 25
- Pass through at least one capital city on the Atlantic Ocean and one capital city on the Indian Ocean

Think about

- Topography (control construction costs)
- Climate (try to avoid harsh areas)
- Environment (build where it would cause the least damage)
- Location of natural resources (What will you need to build and how will you get it there?)
- Location of major/capital cities (ensure contact with highest number of people)
- Tourist attractions (infusion of foreign capital, improve balance of trade)
- Political considerations (War? Refugees?)
- Health issues (tsetse fly, dengue fever, AIDS, Ebola – avoid where possible)



4. LARGE MAP OF PROPOSED ROUTE

CATEGORY	SCHOLAR POINTS AVAILABLE	4	3	2	1
Neatness and choice of color	The appearance of the map is remarkably professional in its neatness and use of color. There is an unexpected quality in the design choices.	Color appropriate for features (e.g., blue for water, black for labels, etc.); exceeds expectations for design; correct size.	Most color appropriate for features (e.g., blue for water, black for labels, etc.); meets expectations for design; correct size.	Some color appropriate for features (e.g., blue for water, black for labels, etc.); does not quite meet expectations for design; possibly not correct size.	Few color appropriate for features (e.g., blue for water, black for labels, etc.); fails to meet expectations for design; possibly not correct size.
Labels — accuracy	Use of labels includes the countries' names in the national language.	At least 90% of the items are labeled and located correctly. 95-100% of words on the map are spelled and capitalized correctly.	80-89% of the items are labeled and located correctly. 94-85% of words on the map are spelled and capitalized correctly.	70-79% of the items are labeled and located correctly. 84-75% of words on the map are spelled and capitalized correctly.	Less than 70% of the items are labeled and located correctly. Less than 75% of words on the map are spelled and/or capitalized correctly.
Labels & features — neatness	Labels are particularly professional in quality.	90-100% of the labels/features can be read easily.	89-80% of the labels/features can be read easily.	79-70% of the labels/features can be read easily.	Less than 70% of the labels/features can be read easily.
Map legend/key	Legend contains some creative element that exceeds the expectation.	Legend is easy-to-find and contains a complete set of symbols, including a compass rose.	Legend contains a complete set of symbols, including a compass rose.	Legend contains an almost complete set of symbols, including a compass rose.	Legend is absent or lacks several symbols.
Title	The typography of the title or the selection of the title displays a sophisticated mastery of understanding of the principals of design or the essence of the project.	Title tells the purpose/content of the map, is clearly distinguishable as the title (e.g., larger letters, underlined, etc.) and is printed at the top of the map.	Title tells the purpose/content of the map and is printed at the top of the map.	Title tells the purpose/content of the map but is not located at the top of the map.	Purpose/content of the map is not clear from the title.
SCORE: ____/20					

Proposal Piece 5. Memo to World Bank

Memo: Final Proposal for Route across Africa

To: The World Bank

From: _____

Subject: Alternate Proposal for Route across Africa

After considering the data and the rejected highway route, I have designed an alternate proposal, which is included here in map form, accompanied by supporting documentation. The proposed highway meets the following criteria:

- Crosses a major portion of the continent.
- Connects major population centers.
- Crosses _____ countries.
- Passes through the capital city of _____ on the Atlantic Ocean and the capital city of _____ on the Indian Ocean.
- Is practical and crucial to the economic development of Africa.

I have emphasized the influence of the physical and human geographic features of the continent in designing our proposal.

Keeping in mind the purposes of the highway, I submit the four specific reasons this proposed route is superior to the rejected plan. I am including reasons concerning physical, cultural, and economic geography, and _____ (personal choice).

1. Physical:

2. Cultural:

3. Economic:

4. _____ (personal choice)

Respectfully Submitted,

5. MEMO TO WORLD BANK

- ____ 15 points Accurately describes work
- ____ 15 point Neatly done, correct grammar and spelling
- ____ 20 points Well-reasoned justification
- ____ **Total / 50**

CUMULATIVE RUBRIC (IF DESIRED)

CATEGORY	4	3	2	1
Physical geography	Thoroughly understands and explains reasons for new route, incorporating accurate information regarding physical features of places on the route.	Reasons given for the new route incorporate accurate information regarding the physical features of places on the route.	Provides barely adequate reasons for the new route and/or incorporates some inaccuracies on physical features.	Incorrect or superficial reasons for new route; incorporates inaccurate information regarding physical features of places on route.
Cultural geography	Thoroughly understands and explains reasons for the new route that incorporate accurate information regarding the cultural features of places on the route.	Reasons given for the new route incorporate accurate information regarding the cultural features of places on the route.	Provides barely adequate reasons for the new route and/or incorporates some inaccuracies on cultural features.	Incorrect or superficial reasons for new route; incorporates inaccurate information regarding cultural features of places on route.
Economic interdependence	Develops fully the reason that relates to economic interdependence and clearly explains how that facilitates trade.	Reasons given relate to interdependence and to promotion of trade routes.	Provides barely adequate reasons that relate to economic interdependence and trade.	Incorrect or superficial reasons that relate to economic interdependence and trade.
Geographic reasoning	Develops completely a justification for proposed route, using important details, facts, and geographic concepts, and then defends the route providing clear, thorough support.	Uses geographic concepts and data to justify why they chose that proposed route based on geographic knowledge acquired, and then defends the route.	Use of geographic concepts and data to justify why they chose that proposed route is weak. Defending the route shows limited understanding of geographic knowledge.	Use of geographic concepts and data to justify why they chose that proposed route reflects an unacceptable understanding or misconception. Defending the route shows no understanding of geographic knowledge.
Acquisition, processing and reporting data	Map work is accurate throughout. Correctly presents a well-planned route that improves on the first route. Demonstrates use of research, as well as maps and data.	Map work is mostly accurate and complete. Presents a well-planned route that improves on the first route. Demonstrates the use of research, as well as maps and data.	Map work is mostly accurate and complete, but with some inaccuracy. Route is somewhat difficult to follow. Research and use of maps and data is not clearly evident.	The map has inaccuracies throughout. Does not demonstrate the use of maps, data, and/or does not have a plausible route. Work is messy and difficult to follow.
Map quality	Map is exceptionally well-colored, neat, attractive, accurate, and visually appealing. The quality of the map contributes significantly to the overall impact of the presentation.	Map is well-colored, neat, attractive, accurate, and visually appealing. The quality of the map contributes to the overall impact of the presentation.	Map is lacking at least one of the following qualities: well-colored, neat, attractive, accurate, or visually appealing. The poor quality of the map does not contribute to the overall impact of the presentation.	Map is lacking more than one of the following qualities: well-colored, neat, attractive, accurate, or visually appealing. The poor quality of the map detracts from the overall impact of the presentation.
SCORE: ____/24				