

Copying Masters

The following pages may be reproduced for instructional use in an educational institution.

Study Questions

Waterworks
Road Systems
Agriculture
Building Construction
Inca Society: Governance
Inca Society: Economy
Inca Society: Religion
Inca Society: Communication
Inca Society: Arts & Recreation

Problem-Based Projects

Project #1: National Geographic Traveler Article
Planning Sheet
Evaluation Checklist

Project #2: The Ice Maiden's Voice
Planning Sheet
Evaluation Checklist

Project #3: History Channel Web Documentary
Planning Sheet
Storyboard Organization Worksheet
Evaluation Checklist

Project #4: Downfall of the Inca Empire Scrapbook
Planning Sheet
Evaluation Checklist

Project #5: Tourism vs. Preservation Debate
Planning Sheet
Evaluation Checklist

Extension Activities

Waterworks

The Inca constructed an elaborate waterworks system, the features of which were as varied as the purposes it served. The sophisticated engineering methods used in its development ensured the longevity of a system still functioning today. The answers to the following questions can be found by exploring the Waterworks section of the Fact File.

1. What regional obstacles did the Inca have to overcome in developing its waterworks system for its vast empire?

2. What functions did the waterworks systems provide?

3. The well-preserved ruins of Machu Picchu represent the Inca engineers' solid understanding of _____ planning.
4. In Machu Picchu the canal carried water from the spring to what?

5. The Inca built these to support the canals and they helped to resist sliding and settling of the land?

6. When planning the site of Machu Picchu the Inca civil engineers had to take into consideration the canal grade to determine what?

7. What was important about the first fountain?

8. How did the Inca engineers increase the amount of water that came from Machu Picchu Mountain?

9. How many people could the waterworks system at Machu Picchu supply at any given time? _____
10. List the different functions of the fountains in Machu Picchu.



11. What environmental factor has affected the waterworks system at Machu Picchu today?

12. How many fountains were located in Machu Picchu? _____
13. What were the uses of the first three fountains in Machu Picchu?

14. Describe and draw the basic design of a fountain.

15. Before the Inca engineers built Machu Picchu what did they have to determine?

16. Explain how the urban drainage system has allowed Machu Picchu to remain standing today.

17. What percentage of construction of Machu Picchu took place underground? _____
18. What were the containers that the Inca collected water in called? _____
19. What unseen feature has reduced the element of erosion at Machu Picchu?

20. List the four levels of construction of the terracing for subsurface drainage.
 1. _____
 2. _____
 3. _____
 4. _____

Road Systems

The Inca Empire consisted of desert coastlands, mountain ranges, open grasslands and jungle regions. An intricate system of roadways was built to connect this diverse and immense empire. The answers to the following questions can be found by exploring the Road Systems section of the Fact File.

1. The Inca Empire was comparable in size to what other great empire?

2. What modern day countries did the Inca Empire span?

3. The Inca road system covered how many miles? _____
4. Explain how the Inca Empire got the name Tawantinsuyu.

5. What was the capital of the Inca Empire? _____
6. During the reign of Pachacuti he expanded the empire and integrated the people using this form of communication?

7. Explain how the roads built during Pachacuti's reign were the lifelines of the Inca civilization.

8. Were all of the roadways built by the Inca the same size? Explain.

9. What was used to mark the distance along the main routes on the road system?

10. Describe four ways Inca engineers overcame obstacles in building the road system.

11. Describe how road surface differed region to region.

12. What did the Inca use as the main means of transportation?

13. Why were roads in the mountainous regions built on steep gradients?

14. Describe the different types of bridges the Inca engineers designed.

15. What material was used to make rope for bridges?

16. What were rest stops called that the Inca built every 15 to 30 miles for the army to use?

17. What was the purpose of Tambos?

18. What was the most common gift offered to an altar along the roadside?

19. Explain how the Inca postal system worked and give an example of its efficiency.

20. The most famous section of the Inca road system is a thirty one-mile trek that leads into Machu Picchu. What is this called?

Agriculture

The Inca were some of the best agronomists in the world. The diversity of the geographic regions of the empire required the use of varied farming techniques. The answers to the following questions can be found by exploring the Agriculture section of the Fact File.

1. Which crops did the Inca grow in higher elevation areas?

2. List the primary crops grown in the valley areas.

3. How did rotating crops improve crop yield?

4. Explain how farming methods were used in the following regions:

a. Desert areas: _____

b. High plateau areas: _____

5. List the three layers used in agricultural terracing.

6. What fertilizer was used in some agricultural terracing?

7. How many acres of land were farmed with agricultural terracing?

8. What was the staple of the Inca diet?

9. Why did the Inca redirect the course of the Urubamba River?

10. What impact have the Inca agricultural practices had on present day practices in the same regions?

Building Construction

The advanced engineering methods used by the Inca are evidenced by the stone masterpieces they created centuries ago. The Inca mastered the collecting, cutting and transporting of stone to create the magnificent stone buildings still seen today at Machu Picchu. The answers to the following questions can be found by exploring the Building Construction section of the Fact File.

1. Describe the typical buildings made centuries ago by the Inca.

2. What materials were used in coastal regions?

3. How did Pachacuti assimilate the accomplishments of the empires he conquered into the Inca Empire?

4. What special significance did stone have to the Inca?

5. List the characteristics of Inca architecture.

6. Describe evidence of geometry in Inca building construction.

7. What is the name of the principal rock quarry used to build Machu Picchu?

8. Summarize the process of collecting and working the stones into four steps
 - a. _____
 - b. _____
 - c. _____
 - d. _____
9. What is the local granite composed of?

10. What were the other two stones used sparingly at Machu Picchu?

11. How did the Inca transport the massive boulders over steep banks?

12. How many workers were estimated to move some of the larger boulders?

13. What was the purpose of thatched roofs?

14. What were the great halls called that were found at Inca royal or administrative sites?

15. How were the great halls used?

16. Describe the wayronas built by the Inca.

17. How were wayronas used?

18. Describe double-jamb doorways.

19. Could anyone enter a double-jamb doorway? Explain.

20. Where did the double-jamb doorways lead?

Inca Society: Governance

The class system within the Inca Empire defined many aspects of the society. Each individual, young or old had responsibilities within the empire. Artifacts recovered at the site reveal a well-organized and maintained social order. The answers to the following questions can be found by exploring the Inca Society section of the Fact File.

1. Each type of ruler had a different type of regional responsibility. Below, draw a line from the type of ruler to the correct level of regional responsibility.

RULER	REGIONAL RESPONSIBILITIES
Apo or Prefects	Supreme authority over the realm
Curacas	Four quarters of Tawantinsuyu
Governors	Administrative towns
Sapa Inca or Emperor	Oversee small villages, mediators between ruling Inca class and small communities

2. What was the status of the Sapa Inca?

3. Describe the rituals and restrictions that dealt with the Sapa Inca.

4. Why were the rituals performed?

5. Was anyone allowed to see the emperor face-to-face? Explain.

6. List the two ways that taxes were collected in the empire.

a. _____

b. _____

7. Did everyone pay taxes? Explain.

8. Describe the treatment of a Sapa Inca who died?

9. Who wore large ear spools made of gold, silver and wood?

10. List two ways that an individual became part of the noble class.

11. Who usually collected the mita?

12. What role did the hatun runa play in society?

13. What is an ayllu?

14. Complete the following chart showing the responsibilities of each member of the hatun runa.

AGE	FEMALE JOBS	MALE JOBS
5-9	<hr/>	<hr/>
9-12	<hr/>	<hr/>
Teens	<hr/>	<hr/>
Adults-age 50	<hr/>	<hr/>

15. Why was being a beautiful girl in Inca society dangerous?

16. List the three golden rules of Inca society.

Inca Society: Economy

The class system within the Inca Empire defined many aspects of the society. Each individual, young or old had responsibilities within the empire. Artifacts recovered at the site reveal a well-organized and maintained social order. The answers to the following questions can be found by exploring the Inca Society section of the Fact File.

1. Explain reciprocal exchange.

2. What was the theory behind the economic system for the Inca?

3. What kept the state alive and supported the emperor and noble class?

4. What was the responsibility of the quipocamayos?

5. What did the hatun runa s life revolve around?

6. Who wore simple tunics or dresses with no jewelry?

7. Who wore jewelry and elegant clothing?

8. Who were required to eat their meals outdoors?

9. Who were allowed many wives?

10. How did the commoners supplement their diet?

Inca Society: Religion

The class system within the Inca Empire defined many aspects of the society. Each individual, young or old had responsibilities within the empire. Artifacts recovered at the site reveal a well-organized and maintained social order. The answers to the following questions can be found by exploring the Inca Society section of the Fact File.

1. Where was the headquarters of the Inca government and religion located?

2. How frequently did the Inca take part in religious ceremonies?

3. What role did the religious observances play for the emperor?

4. Where did the food and drink used in the festivals come from?

5. List four reasons the Inca would feast.

6. What was the significance of a huaca?

7. List three examples of an Inca huaca.

8. How did the Inca belief in huacas possibly contribute to the well-preserved condition of Machu Picchu?

Inca Society: Communication

The class system within the Inca Empire defined many aspects of the society. Each individual, young or old had responsibilities within the empire. Artifacts recovered at the site reveal a well-organized and maintained social order. The answers to the following questions can be found by exploring the Inca Society section of the Fact File.

1. What was Quecha?

2. Did the Inca communicate in writing?

3. What were the benefits of the roadway system created by Pachacuti?

4. Describe the device used to maintain the records of the state.

5. Who used the quipu?

Inca Society: Arts & Recreation

The class system within the Inca Empire defined many aspects of the society. Each individual, young or old had responsibilities within the empire. Artifacts recovered at the site reveal a well-organized and maintained social order. The answers to the following questions can be found by exploring the Inca Society section of the Fact File.

1. What was the significance of poetry recitation?

2. What kinds of instruments were prevalent in Inca society?

3. What props were used in dancing?

4. Who wore cumbi cloth?

5. What feature of Inca society separated the people into classes?

6. Did the metal worker and potters perform agricultural duties? Explain.

National Geographic Traveler Article Planning Sheet

Name : _____

Imagine that you have been hired by National Geographic to write an article about Machu Picchu. Use the virtual tour mode in the software to provide you with information about the features of the ruins and supplement your article with fact file information to give a historical overview of the life of the Inca.

Here are some guidelines to follow as you develop your presentation:

1. Write your article as if it were to be published in the travel magazine.
2. Be sure to include facts about waterworks, road systems, agriculture, building construction and Inca society. Use the Machu Picchu learning node and outside research to gather your information.
3. Use images of Machu Picchu to support your text. Here are few online resources to get you started:
http://www.he.net/~mine/inca/picchu_page_1.html <http://technivore.net/travel/peru/machu/index.htm>
<http://www.geocities.com/Baja/1493/>
4. You may present your article in the manner of your choice. Some possible options include creating your article using word processing software or making a presentation using presentation software.

National Geographic Traveler Article Evaluation Checklist

Name : _____

The article contains:

- o A catchy opening to grab the reader's attention
- o A description of the features of Machu Picchu
- o A map of Machu Picchu
- o Information about the history of the Inca for each of the following:
 - Inca society
 - Agriculture
 - Communication
- o Information about the building construction
- o Possible hypotheses for the use of Machu Picchu
- o Images of Machu Picchu to support the text
- o Evidence of clear, concrete thought organization
- o Writing revised for clarity, coherence, economy, syntax, and style
- o Writing edited for appropriate mechanics and usage

The Ice Maiden's Voice Planning Sheet

Name : _____



A volcanic eruption revealed her remains in 1995. A victim of child sacrifice from the time of the Inca, she was nicknamed Juanita the Ice Maiden. What was her story? You will research the custom of child sacrifice and perform a virtual autopsy on Juanita to discover what her life was like. Then, you will give her a voice.

Here are some guidelines to follow as you write her story:

1. Archeologists have learned a great deal about human sacrifice from the ice mummies retrieved in Peru. Use the following resources to learn about the sacrificial ceremonies and burial artifacts

<http://www.pbs.org/wgbh/nova/peru/worlds/sacrificel.html>

<http://www.pbs.org/wgbh/nova/peru/worlds/artefactsl.html>

2. Here you will perform a virtual autopsy on the Ice Maiden to understand what her life may have been like:

<http://www.nationalgeographic.com/features/97/andes/>

3. Here are other resources about mummies:

<http://www.exn.ca/Mummies/Andes.cfm>

http://www.nationalgeographic.co.uk/inca_mummies/mummies.shtml

<http://www.pbs.org/wgbh/nova/peru/mummies/high1.html>

4. Conclude this project with a separate section that explains how you would feel if you had been chosen for sacrifice in Inca times.

The Ice Maiden s Voice Evaluation Checklist

Name : _____

The story contains:

- o Writing presented in the point of view of the Ice Maiden, Juanita
- o A catchy opening to grab the reader s attention
- o An overview of her life and position in the society
- o An explanation of how she felt about her position in society
- o An explanation of why she was chosen for sacrifice
- o How she felt about being chosen
- o Interactions with her family about being chosen
- o A narrative of the last two weeks of her life
- o An account of the ritual ceremony
- o A description of the significance of each of her burial artifacts
- o Interaction with the Sapa Inca
- o A section that describes how you would feel if you had been chosen
- o Evidence of research about the time period / archeological findings
- o Evidence of clear, concrete thought organization
- o Writing revised for clarity, coherence, economy, syntax, and style
- o Writing edited for appropriate mechanics and usage

History Channel Web Documentary Planning Sheet

Name : _____

Imagine that you have been hired by the History Channel to create a web documentary of the history of the Inca, with an emphasis on the reign of Pachacuti and Machu Picchu. Using any available web software (even word processing software will work) you will create a web site where people can have instant access to facts about the Inca. Your documentary will conclude with a brief section on the descendants of the Inca who live in Peru.

Here are some guidelines to follow as you develop your web documentary:

1. Use the Machu Picchu learning node and your own research to develop your documentary. Here are some online resources to get you started:

http://www.nationalgeographic.com/inca/inca_culture.html

<http://www.washburn.edu/hiweb/ClassicalMed/IncaImages.html>

http://www.gypsylounge.com/x/sam/history_lesson/peru.htm <http://www.theincas.com/index.html>

<http://www.shastahome.com/machu-picchu/guide.html> http://www.he.net/~mine/inca/picchu_page_1.html

<http://technivore.net/travel/peru/machu/index.htm> <http://www.geocities.com/Baja/1493/>

http://www.millville.org/Workshops_f/Acker_Inca/inca.htm

2. Conclude your documentary with a brief description of the life of the descendants of the Inca. Here is one resource to get you started:

<http://www.incas.org/index.html>

3. To help you with your design of the web page, explore the web to see different layouts and styles you find appealing. You might even visit the History Channel website itself to see their layout. If possible, put your web documentary online for all to see. If this option is unavailable, an alternative is to create a presentation to showcase your work.

History Channel Web Documentary Evaluation Checklist

Name : _____

The documentary contains:

- o A list of the Inca rulers
- o Facts about Pachacuti's reign
- o Information about Machu Picchu
- o Facts about:
 - Inca social customs
 - Inca class structure
 - Inca economy
 - Inca government
- o An explanation of the impact each of the areas listed above had on the other areas
(Example: How did the government affect the economy, how did the social customs affect the economy)
- o A description of the descendants of the Inca living in Peru
- o Evidence of clear, concrete thought organization
- o Writing revised for clarity, coherence, economy, syntax, and style
- o Writing edited for appropriate mechanics and usage

Downfall of the Inca Empire Scrapbook Planning Sheet

Name : _____

What led to the fall of the mighty empire that stretched over 2,500 miles from modern-day Ecuador to Chile? In this project you will discover how an army of 37 horsemen and 106 foot soldiers conquered an empire of 10 million subjects. You will create a multimedia scrapbook from the point of view of somebody affected by the events explaining how the Inca were defeated by so few.

Here are some guidelines to follow as you develop your multimedia scrapbook:

1. Research the downfall of the Inca using any available resources. Here is one online resource to get you started:

<http://www.incaconquest.com/>
2. You have many options for your scrapbook. You may create a presentation using presentation software, use word processing software or web software. You may also create your scrap book using photographs or drawings with hand written text made to look like that of the conquerors or an Inca ruler or commoner for effect. (You can pretend that the Inca had a written language for this scenario.) Just remember the scrapbook should be an account from the point of view of a person of your choice who was affected by the events

Downfall of the Inca Empire Scrapbook Evaluation Checklist

Name : _____

The scrapbook contains:

- o Writing presented in the point of view of a person involved
- o A catchy opening to grab the reader's attention
- o A description of the conquerors (who were they)
- o An overview of the Inca ruling class at the time of the downfall
- o An explanation for reasons the Inca were conquered
- o How the conquer affected the person's life
- o Hand written or typed text
- o Pictures / drawings to support the text
- o Evidence of research on the downfall of the Incas
- o Evidence of clear, concrete thought organization
- o Writing revised for clarity, coherence, economy, syntax, and style
- o Writing edited for appropriate mechanics and usage

Tourism vs. Preservation Debate Planning Sheet

Name : _____

How do you balance a poor country's hunger for tourist dollars with worries about protecting its heritage? The issue of further development at Machu Picchu has generated a great deal of controversy. In this project, you will research the pros and cons of development at Machu Picchu and deliver a persuasive argument for the UNESCO World Heritage Committee who oppose it, and the Peruvian Chamber of Tourism who endorse it. The format of your arguments will be letters to the Peruvian President to inform him of each position. One letter will express opposition and the other will express support. In the process of this project, you will be able to develop your own opinion of this controversial issue.

Here are some guidelines to follow as you develop your debates:

1. The UNESCO has a website with a wealth of information about the planned developments at:
<http://mpicchu.org/index.html>

2. Here are a couple of articles about the planned developments to get you started in your research:
<http://www.rose-hulman.edu/~delacova/incas/tourism.htm>
<http://archaeology.about.com/library/weekly/aa082299.htm>

3. The address for the Peruvian President is:

Presidente de la Republica del Peru
Palacio de la Republica
Plaza de Armas
Lima, Peru

*At the end of the project when you have formulated your own opinion, you may send the letter of your choice to the President.

Tourism vs. Preservation Debate Evaluation Checklist

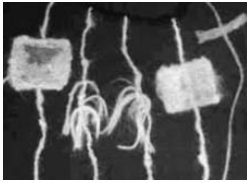
Name : _____

The Letters contain:

- o Correct letter format
- o One letter supporting the developments at Machu Picchu
- o One letter opposing the developments at Machu Picchu
- o Writing to support each argument with facts / statistics
- o Evidence of research of the impact of developments at Machu Picchu
- o Evidence of research about the Peruvian economy
- o Diagrams / images / graphs to support each argument
- o Letters typed in a word processing program
- o Language and organization appropriate for audience and purpose
- o Evidence of clear, concrete thought organization
- o Writing revised for clarity, coherence, economy, syntax, and style
- o Writing edited for appropriate mechanics and usage

Extension Activities

Name : _____



Make a quipu

How did the Inca keep track of every person, animal and supply in the empire with no written language? In this extension activity, you will discover the secret of the quipu and learn how to make your own. Use the following online resource:

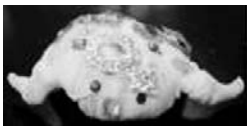
<http://wiscinfo.doit.wisc.edu/chaysimire/titulo2/khipus/what.htm>



The Inca Calendar

Although the Inca had no written language, it is believed that there was a formal calendar. You can research the existence of a calendar and compare it to our calendar. Here is one place to start the research:

<http://www.carmensandiego.com/products/time/incasc09/calendar.html>



Mummy Experiments

To learn about the process of mummification, you can make fish, chicken or even fruit mummies by following the directions on the following websites:

Apple: <http://unmuseum.mus.pa.us/exmum.htm>

Fish: http://www.exploratorium.edu/bodies/webcast_activity.html

Chicken: http://www.cargillsalt.com/sfbay/KP_mummy.html

In addition, if you would like an artistic project, you can create a model of a mummy using plasticene and Plaster of Paris bandages by following the directions at:

<http://www.rom.on.ca/egypt/mummy/mum1.html>



Tax Adventures

To build on the concept of the mit a tax from the time of the Inca, you can learn about the tax system of the United States at the IRS website and compare the two. There is a section designed specifically for students with history, lessons and simulations at:

http://www.irs.gov/app/understandingTaxes/jsp/s_student_home.jsp