The Geographic View of Our World

Audience: 9th Grade
Time Frame: 4 Weeks

Standards Addressed (TEKS)

World Geography
- 3A Attribute occurrences of weather phenomena and climate to annual changes in Earth-Sun relationships.
- 3B Describe physical environment of regions and the physical processes that affect these regions such as weather, tectonic forces, wave action, freezing and thawing, gravity, and soil-building processes.
- 4A Explain the distribution of different types of climate in terms of patterns of temperature, wind, and precipitation and the factors that influence climate regions such as elevation, latitude, location near warm and cold ocean currents, position on a continent, and mountain barriers.
- 4B Relate the physical processes to the development of distinctive land forms
- 4C Explain the distribution of plants and animals in different regions of the world using the relationships among climate, vegetation, soil, and geology.
- 21A Use historical, geographic, and statistical information from a variety of sources such as databases, field interviews, media services, and questionnaires to answer geographic questions and infer geographic relationships.
- 21B Analyze and evaluate the validity and utility of multiple sources of geographic information such as primary and secondary sources, aerial photographs, and maps.
- 21C Construct and interpret maps to answer geographic questions, infer geographic relationships, and analyze geographic change.
- 21E Use a series of maps, including a computer-based geographic information system, to obtain and analyze data needed to solve geographic and locational problems.
**Desired Results**

**Unit Understandings:**

- Geographers use concepts and tools to interpret the world.
- Physical patterns and processes affect the nature and distribution of the earth’s features.

**Unit Questions:**

- To what extent do geographers shape our view of the world?
- What concepts and tools do geographers use to interpret the world?
- How do physical processes affect the location and distribution of physical features on the earth?

**TEKS Questions (*TAKS Student Expectations*)**

- How does the geographer use historical, geographic, and statistical information from a variety of sources to answer geographic questions and infer geographic relationships? (WG21A*)
- How does the geographer analyze and evaluate the validity and utility of multiple sources of geographic information? (WG21B)
- How are maps used to obtain geographic information, analyze data, answer geographic questions, infer geographic relationships, and analyze geographic problems? (WG21C*, 21E)
- How are basic statistical concepts and analytical methods used to analyze geographic data? (WG21D)
- How do physical processes shape patterns in the physical environment? (WG3A, 3B)
- What are the patterns and characteristics of major landforms, climates, and ecosystems of Earth? (WG4A, 4B, 4C)

**Knowledge and Skills:**

**Knowledge**

- Location: absolute and relative; latitude and longitude
- Tools of geography: globes, different types of maps, instruments, and technology
- Types of land and water features: ocean, sea, gulf, bay, lake, strait, canal, river (source and mouth), delta, continent, peninsula, island, basin, plateau, mountain range, plain, valley
- Internal forces that affect physical features: tectonic plate movement, volcanoes, earthquakes
- External forces that affect physical features: weathering and erosion (water, wind and glacial)
• How earth/sun relationships affect weather, seasons, and climate patterns
• Distribution of different types of climate in terms of patterns of temperature, wind, and precipitation
• Factors that influence climate regions such as elevation, latitude, location near warm and cold ocean currents, position on a continent, and mountain barriers.
• Distribution of plants and animals in different regions of the world using the relationships among climate, vegetation, soil, and geology
• Characteristics of historical journals written by explorers

Skills
• Interpret maps and keys
• Create physical and climate maps including lines of latitude and longitude, compass rose, title, and key
• Organize geographical information and record journal entries
• Read for information from textbook and primary sources
• Take graphically organized notes
Evidence of Understanding

Performance task

Students will explore and map a newly discovered continent in order to explain the physical processes that created its major land and water features and describe the patterns and characteristics of the continent’s climates and ecosystems.

Student Instructions:

Goal: Explore and map a newly discovered continent in order to explain the physical processes that created its major land and water features and describe the characteristics of the continent's climates and ecosystems.

Role: You are a 16th Century world explorer

Audience: Your king (or queen)

Situation: You are a brave explorer who has just discovered a new continent. You now have the privilege of being the first to describe and map this uncharted territory. In honor of your arrival to this new land, your king gives you the right to name all land and water forms that you discover. As his chief explorer and scientific advisor, you also have a duty to explain the geographic formation of the continent’s physical features. Since the king also has an interest in colonizing the new land, he requires that you take detailed notes describing the climate and vegetation regions located on the continent. If your report is of high quality, the king may allow you to start your own colony here.

Product: In order to convince the king that you understand the continent enough to begin its first settlements, you must map the continent and keep a log of your explorations:

- Sketch a physical map including at least three different landforms and three different water features. Remember to name each one.
- Sketch a separate climate map (or an overlay) including at least three appropriate climate regions found on the continent. Make sure the climates are consistent with world climate patterns.
- Begin your exploration log by recording journal entries describing the location of the continent’s land and water features and explaining the physical processes that created them.
- Continue your exploration log by describing your travels through the different climate regions (give location, temperature, precipitation, and ecosystem of each region). Explain the factors that influence the continent’s climate regions and clearly show that the new continent’s climates are consistent with typical patterns of world climates.
Standard: The king will evaluate your exploration of the continent based on:

- The quality of your maps. Each one should be neat, colorful and include lines of latitude and longitude, a compass rose, a title, and a key.
- How well you demonstrate that a wide variety of physical processes affect the environment of the newly discovered continent.
- How well you prove that the climates and ecosystems on this new continent are consistent with the patterns and characteristics of similar climates and ecosystems around the world.
<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Points Possible</th>
<th>Points Earned</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>High quality physical map includes realistic land and water features, title, key, grid system, and compass rose.</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Climate Map includes appropriate climate regions, title, key, grid system, and compass rose. Map is neat, clear, colorful, and detailed.</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exploration log explains how physical processes have shaped the land and water features of the continent</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exploration log describes characteristics of each climate region including location, temperature, precipitation, and ecosystem</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exploration log analyzes a variety of factors that influence the climate regions and proves that climate regions match world patterns</td>
<td>20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total Points Earned ______
Learning Experiences and Instruction

Elements of an Interactive Student Notebook lesson:
• Hook – activates student prior knowledge to assist understanding
• Line – graphically organized notes make information clear to students
• Sinker – students process what they have learned in a new way

Lesson 1: Unit Hook and Introduction of Performance Task (1 hour)

• Students answer the following prompt: “You have just found out that your family must move to Kalamazoo, Michigan. Your parents are already in Kalamazoo and need you to drive the family car to your new home. What do you want to find out before you begin your journey? List all the information you need to know and how you plan on finding it.” Have students share their answers with a partner, and then create a class list on the board. Emphasize the importance of using maps, data, and news sources to discover the transportation routes, physical characteristics, climate, and culture of new locations.

• Introduce the performance task. Distribute the student instructions and rubric (see above), show examples of world historical maps, and provide a portion of Columbus’ or Lewis and Clarks’ historical exploration journals (see resources). Students should analyze these primary sources to understand characteristics of historical journals such as dated entries, observations about physical surroundings, comments about human relationships while exploring unknown places, and the explorers’ need to understand the geography of the world around them.

Lesson 2: Location (1.5 hours)

• **HOOK**: Students answer the following questions: “Where do you live?” and “Where is your school located?” Expect students to ask for clarification but allow the questions to remain vague so that students will include a variety of relative and absolute locations in their answers.

• **LINE**: Students take Main Idea/Detail notes (see Project CRISS) about absolute and relative location (p.6, textbook). The teacher should first model how to take main idea/detail notes, and then students should complete their notes individually. Visually review latitude and longitude (Map Transparencies 3, 3a, and 3b).

• **SINKER**: Students work in groups to compete in the World Rally Race. At each checkpoint, the teacher assesses understanding of how to use latitude and longitude. Give awards to teams that complete all checkpoints or that advance the farthest by the end of the class period. See Appendix A.
Lesson 3: Gathering Information from Different Types of Maps (1.5 hours)

- **HOOK:** Students answer the following prompt: “What kinds of things can you show on a map? List everything that you can think of.” Students share their answers with a partner, and then the teacher compiles a class list on the board or overhead.

- **LINE:** Using the Texas State Almanac (pp. S28-S37, textbook), students decide which type of map to use to answer a variety of questions about Texas. See Appendix B.

- **SINKER:** Students imagine taking a road trip from Houston to El Paso. They use the Texas maps to describe the roads, population centers, landforms, elevation, climate, and economic activities that they pass along their journey. Students should include sketches of what they see and experience during the road trip.

Lesson 4: Land and Water Features of the Earth (1.5 hours)

- **HOOK:** Students answer the following question: “Have you ever been (or dreamed of going) to a place that has more interesting physical characteristics than Houston? Describe the land and water features of that place.”

- **LINE:** Students create a visual guide of land and water features using History Alive! (USH 8-1 1.2). Students may use the two-page illustration of landforms as a visual aid when completing the lesson (pp. 34-35, textbook).

- **SINKER:** Imagining that they just discovered a new island in the Pacific Ocean, students write a journal entry describing three land features and three water features they discovered and sketch a map of the island’s landforms.

Lesson 5: Forces that Shape the Earth (1.5 hours)

- **HOOK:** Ask students to hold their hands out in front of them with their palms down. Have them press the sides of their index fingers together as hard as they can for as long as they can. Students will notice that their hands will either slip by each other, both move upward, or one move upward and the other below it. All of the results demonstrate plate tectonic actions that result in the creation of mountains and earthquakes. Students answer the following prompt: “Explain what happened when you pressed your hands together. How might the result be connected to forces that happen in the physical world?”

- **LINE:** Students take Cause/Effect notes (see Project CRISS) on internal and external forces that shape the earth. Notes should include plate tectonic movement, earthquakes, volcanoes, erosion (wind, water, and glacial), and types of weathering. Use textbook p. 37-44 or Appendix C.

- **SINKER:** Using the journal entry from the previous lesson, students describe which internal or external forces created the land and water features on their island. Ask volunteers to illustrate examples of landform formation so that students can verify that their answers are correct.
Lesson 6: Climate Regions and Patterns (1.5 hours)

- **HOOK:** Students answer the following prompt: “Write a letter to a friend in another state describing the weather (temperature and precipitation) in Houston today. Is today’s weather normal for this time of year? What will the weather be like in January?”
- **LINE:** In groups, students create small posters containing visual symbols that show the location and characteristics of their assigned climate region (pp. 60-63, textbook). Remind students that symbols are simple illustrations that represent an idea—posters do not need detailed drawings or extensive writing. Groups present their climate regions as students take notes on the Global Climate Regions chart. See Appendix D.
- **SINKER:** Students choose a climate region, find a country in that region, and write a postcard to a friend back home that includes the following: the location of the traveler, five specific items brought along for the trip, the temperature, and the precipitation. If time allows, give students note cards and have them write the letter on the back of the card and draw a picture on the front.

Lesson 7: Factors that Influence Climate (1.5 hours)

- **HOOK:** Students answer the following question: “Why is it hot in Houston? Why doesn’t it get extremely cold in the winter here? Why is it so cold in Alaska?” Lead students in a short discussion of factors they may already know that affect weather such as location, latitude, and oceans.
- **LINE:** Students take graphically organized notes about factors that affect climate (LAME COWS). In the middle of the notes (and at the end), break students into groups and have each group create a skit that demonstrates how one of the factors affects climate. See Appendix E.
- **SINKER:** Using the same imaginary island from Lessons 4 and 5, students sketch a rough climate map of 2-3 climate regions on their island and explain how each climate region is geographically reasonable.

Lesson 8: Biomes (1.5 hours)

- **HOOK:** Students work in pairs to organize a group of pictures into two concept groups: Rainforest and Desert. Discuss how students figured out which words and pictures fit under the heading based on their prior knowledge. Note that some pictures could possibly be found in both environments. See Appendix F.
- **LINE:** In groups, students create science museum exhibits (on butcher paper) that illustrate the vegetation and animal life found in their assigned biome. Post the biome exhibits around the room. Model how to take web notes starting with a center circle titled “Biomes” (see Project CRISS). Students then take a “museum tour” by walking around the room and completing their web notes. For more detailed information than textbook pp. 65-66, print out or give students access to www.worldbiomes.com, a website that includes summaries and pictures of major biomes. See resources for additional biome websites.
• **SINKER:** In their journals, students create sensory figures that describe the vegetation and animals found in two of the climate regions on their island. Sensory figures include a stick person with a line pointing to the eyes labeled “I see...,” a line pointing to the ears labeled “I hear...,” etc. (see History Alive! manual). Students complete the phrases using their web notes and imagination.

**Lessons 9: Performance Task (3.5 hours)**

• Students use their island sketches and journal entries as rough drafts to assist them in completing the performance task. (See instructions)
Gifted/Talented Extensions

- Lesson 2: Copy the first chapter of *Longitude* by Dava Sobel (or assign the book as outside reading). Students create a cartoon strip illustrating the problem of measuring longitude and how John Harrison solved it.
- Lesson 3: Allow students to continue their road trip from El Paso to a more distant city (perhaps San Francisco or Seattle). Using the textbook, atlas, and outside sources, students find maps that provide the necessary information to describe the roads, population centers, landforms, elevation, climate, and economic activities they pass on their journey.
- Lesson 5: Create a flip chart for children illustrating two internal and two external forces that shape the earth. On each page, include a short summary of the force, an example, and a simple diagram showing how the force shapes the earth.
- Lesson 6: Have students create a world climate map and key. Next to each climate region in the key, students draw one useful item to bring when visiting a place with that climate. Also, students could interpret climographs (p. 64, textbook and pp. 27-28, Unit 1 In-Depth Resources).
- Lesson 7: Students should try to explain how each factor in LAME COWS affects climate and weather patterns in Houston, Seattle, or other cities around the world.
- Lesson 8: To require students to learn more specific details about each biome, break the five broad regions into their sub regions (i.e. instead of aquatic—use marine and freshwater; instead of forest—use rainforest, coniferous, deciduous, etc).
- Performance Task: On their continent’s physical map and key, students add the route that they explored the continent as recorded in their exploration journal. Also, by researching examples of historical journals, students make their journals more realistic by using words and phrases consistent with the time period of exploration.
Technology Tips

- Find, or have students find, pictures from the Internet that show examples of landforms and water features.
- Students can use a word processing program to type their exploration journals or set them up in a newspaper format.
- Students can use a computer program to draw their map of the continent.
- Allow students to add computer graphics and pictures to their continents and exploration journals.
- Students may create a PowerPoint slide show to share information learned at different points throughout the unit.
- Use the websites to share information with the class through the Lite Pro or TV.

Modifications

- Allow students to work in pairs during individual activities for support.
- Model different types of notes with the class before students need to take notes from reading or lecture. Main idea/detail notes, web notes, cause/effect charts, tables, illustrated dictionary, etc.
- Form mixed-ability groups based on multiple intelligences.
- Check with science teachers for additional materials when teaching forces that shape the earth and biomes.
- Provide time for peer revision of performance tasks.
- Modify the number of required land and water features on the continent and in the exploration journal of the performance task.
- Suggest that visual students use more diagrams and sketches the exploration journal and reduce the amount of writing.
Resources

- UT Library Online. Historical Map Web Sites. [http://www.lib.utexas.edu/maps/map_sites/hist_sites.html](http://www.lib.utexas.edu/maps/map_sites/hist_sites.html)
- History Alive! U.S. History 8-1 *Geography of America from Past to Present*
- WorldBiomes.com [http://www.worldbiomes.com](http://www.worldbiomes.com)
- Vegetation Regions. [http://www.rickriordan.com/vegetation_regions.htm](http://www.rickriordan.com/vegetation_regions.htm)
WORLD RALLY RACE

You will be taking a trip around the world in the form of a rally race. The object is to be the first group to complete the trip by having answered all the questions en route. Checkpoints along the way are to be verified by the teacher before moving on to the next checkpoint. Teamwork, speed, and accuracy are essential to being competitive in, or winning the rally. Prizes will be awarded!

Each checkpoint is a set of latitude and longitude coordinates that locate a major city, state, or country. You must provide the country and the continent for the location of every checkpoint. Between the checkpoints, several questions dealing with the trip from one city to the next must be answered. You must correctly answer all the questions and receive verification for the designated checkpoints before moving on to the next.

Designate a group leader. When your group completes a checkpoint, have your group leader bring the slip up to me for verification. If all the answers are correct, the teacher will then give you the coordinates for your next destination. If not, the teacher will give it back to the group leader and the group must go back, find their mistake, and then bring it back for verification. If you have any questions, please ask the teacher.

The first team to receive verification on all checkpoints is declared the winner. Good luck and have a safe trip!!!

MEMBERS IN GROUP:
1.
2.
3.
CHECKPOINT #1: Start at 29°N, 98°W and go to (pg. A4 textbook)
Country: ___________________________(where you ended up)
Continent: ___________________________(where you ended up)
A. What is the name of the well-known latitude line that you crossed? ___________________________
B. What is the name of the capital city nearest this point? ___________________________

CHECKPOINT #2: (pgs. A4, A13 textbook)
Country: _____________________________
Continent: ____________________________
A. In what city are you located? ___________________________
B. What 2 countries border this country?
   1. ___________________________
   2. ___________________________
C. What body of water is located to the west of this country? ___________________________

CHECKPOINT #3: (pgs. A4, A11 textbook)
Country: _____________________________
Continent: _____________________________
A. What sea did you cross? ___________________________
B. What type of landform is this country? ___________________________
C. What is the name given to the large islands in this sea? ___________________________
D. What is the capital of this country? ___________________________

CHECKPOINT #4: Country: _____________________________
Continent: _____________________________
A. What is the name of the largest river that you crossed? ___________________________
B. What well-known parallel or latitude line is 1.5 degrees south of checkpoint #4? ___________________________
C. What season is it here in July? ___________________________

CHECKPOINT #5: Country: _____________________________
Continent: _____________________________
A. What ocean did you cross? ___________________________
B. Near what navigational point (isthmus, strait, cape,etc.) is this city located? ___________________________
C. What desert is 10°NW of this city? ___________________________

The Geographic View of Our World 15
CHECKPOINT #6:  
Country: _________________________________  
Continent: ________________________________  
A. What sea is located to the south? ________________________  
B. What international canal did you cross or pass near? ______________________  
C. What country located directly north? _________________________________  
D. What is this country’s (C) capital? ________________________________  

CHECKPOINT #7:  
Country: __________________________________  
Continent: _________________________________  
A. Name the 4 countries bordering this country.  
   1.  
   2.  
   3.  
   4.  
B. What island is located west of this checkpoint? _________________________  
C. What is the capital of this country? ______________________________  

CHECKPOINT #8:  
Country:  
Continent:  
A. What direction did you fly to get here? ____________________________  
B. How many degrees of latitude did you cross to get here? _________________  
C. What body of water did you cross to get here?  ______________________  

CHECKPOINT #9:  
Country: ____________________________________  
Continent: ___________________________________  
A. What is the main mountain range in the western part of this country?  
   ____________________  

CHECKPOINT #10:  
Country: _________________________________  
Continent: ________________________________  
A. What is the name of the country located directly east of here? _______________  
B. What is the capital (of A)? ____________________________  
C. The most populous country in the world is to the west. What is it? _______________

The Geographic View of Our World 16
CHECKPOINT #11:
Country: ____________________________________
Continent: _______________________________________
A. What 3 countries border this country?
   1. 
   2. 
   3. 
B. Within 2 degrees either way, how many degrees of latitude does this country extend? _________________

CHECKPOINT #12:
Country: ____________________________________
Continent: _______________________________________
A. What island is directly to the south? __________________________
B. What ocean is to the west? ___________________________
C. What is the name of the city found directly in the center of this country? __________________________

CHECKPOINT #13:
Country: _____________________________________
Continent: ________________________________________
A. Name the 8 islands that make up this state?
   1. 5.
   2. 6.
   3. 7.
   4 8.
B. True or False. There are active volcanoes here. _________________________

CHECKPOINT #14:
Country: ____________________________________
Continent: _________________________________________
A. What ocean did you cross? ______________________________
B. What large city is located directly east? _____________________________
C. Name the 3 bordering states.
   1. 
   2. 
   3.

Congratulations! You successfully completed the race!
ANSWER KEY – World Rally Race

Checkpoint #1  Find **29°N, 98°W** with students (Houston). Then write **19°N, 100°W** on the board to begin the World Rally Race. (Mexico City)
Country where you end up: Mexico
Continent where you end up: N. America
A. Tropic of Cancer
B. Mexico City

Checkpoint #2  **0°, 79°W** (Quito, Ecuador)
Country where you end up: Ecuador
Continent where you end up: S. America
A. Quito
B. Peru, Colombia
C. Pacific Ocean

Checkpoint #3  **18°N, 78°W** (Kingston, Jamaica )
Country where you end up: Jamaica
Continent where you end up: N. America
A. Caribbean
B. Island
C. Greater Antilles
D. Kingston

Checkpoint #4  **23°S, 43°W** (Rio De Janeiro)
Country where you end up: Brazil
Continent where you end up: S. America
A. Amazon
B. Tropic of Capricorn
C. Winter

Checkpoint #5  **34°S, 18°E** (Cape Town, S.A.)
Country where you end up: South Africa
Continent where you end up: Africa
A. Atlantic
B. Cape
C. Namib Desert

Checkpoint #6  **35°N, 33°E** (Cyprus)
Country where you end up: Cyprus
Continent where you end up: Europe or Asia
A. Mediterranean
B. Suez Canal
C. Turkey
D. Nicosta

Checkpoint #7  **42°N, 13°E** (Rome, Italy)
Country where you end up: Italy
Continent where you end up: Europe
A. France, Switzerland, Austria, Slovenia
B. Sardinia, Corsica
C. Rome

Checkpoint #8  **51°N, 0°E/W** (London, UK)
Country where you end up: United Kingdom
Continent where you end up: Europe
A. Northwest
B. 9
C. English Channel (or Strait of Dover)

Checkpoint #9  **56°N, 38°E** (Moscow, Russia)
Country where you end up: Russia
Continent where you end up: Europe/Asia
A. Urals

Checkpoint #10  **38°N, 127°E** (Seoul, S.K.)
Country where you end up: South Korea
Continent where you end up: Asia
A. Japan
B. Tokyo
C. China
Checkpoint #11  21°N, 106°E (Hanoi, Vietnam)
Country where you end up: Vietnam
Continent where you end up: Asia
A. Laos, Cambodia, China
B. 10 degrees

Checkpoint #12  34°S, 151°E (Sydney, Australia)
Country where you end up: Australia
Continent where you end up: Australia
A. Tasmania
B. Indian Ocean
C. Alice Springs

Checkpoint #13  21°N, 158°W (Hawaii)
Country where you end up: United States
Continent where you end up: North America
A. Nihau, Kauai, Oahu, Molokai, Lanai, Maui, Hawaii, Kahoolawe
B. True

Checkpoint #14  38°N, 122.5°W (San Francisco, CA)
Country where you end up: United States
Continent where you end up: North America
A. Pacific
B. Oakland, CA
C. Oregon, Nevada, Arizona
## Appendix B

**Gathering Information from Different Types of Maps** (Textbook, pp. S30-S35)

<table>
<thead>
<tr>
<th>Best Type of Map to Use</th>
<th>Answer to the Question(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. To drive from Houston to Dallas, which highway would you take and what direction would you drive?</td>
<td></td>
</tr>
<tr>
<td>2. What is the average rainfall per year in Fort Worth? Does it rain more in Fort Worth or in Houston?</td>
<td></td>
</tr>
<tr>
<td>3. What is the name and location of the tallest mountain in Texas?</td>
<td></td>
</tr>
<tr>
<td>4. In what part of Texas are most vegetables grown?</td>
<td></td>
</tr>
<tr>
<td>5. What kind of trees and plants would you expect to find in East Texas?</td>
<td></td>
</tr>
<tr>
<td>6. What is the capital of Texas? What highway connects this city to San Antonio?</td>
<td></td>
</tr>
<tr>
<td>7. Do more people live in the eastern part or the western part of Texas?</td>
<td></td>
</tr>
<tr>
<td>8. What climate does El Paso have? Should you bring a raincoat or sunscreen if you’re visiting El Paso?</td>
<td></td>
</tr>
<tr>
<td>9. What river forms the border between Texas and Mexico?</td>
<td></td>
</tr>
<tr>
<td>10. How do people in the panhandle of Texas (northern section) make money?</td>
<td></td>
</tr>
</tbody>
</table>
1. **Tectonic Plate Activity – “building up”**

<table>
<thead>
<tr>
<th>CAUSE</th>
<th>EFFECT</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convergent boundary (plates collide)</td>
<td>1. If two continental plates…may fold together into high mountains</td>
<td>Himalayas</td>
</tr>
<tr>
<td></td>
<td>2. If an ocean plate and a continental plate…ocean plate moves under, land plate over, and forms volcanic islands/mountains</td>
<td>Andes</td>
</tr>
<tr>
<td>Divergent boundary (plates move apart)</td>
<td>1. If continental plates…may form volcanoes, highlands, and lakes</td>
<td>Great Rift Valley</td>
</tr>
<tr>
<td></td>
<td>2. If ocean plates…magma moves to surface, cools, and creates mountains on ocean floor</td>
<td>Mid-Atlantic Ridge</td>
</tr>
<tr>
<td>Transform boundary (plates slide past each other)</td>
<td>Fault line = earthquakes</td>
<td>San Andreas</td>
</tr>
<tr>
<td>“Hotspots” – thin layer of crust</td>
<td>Magma melts through = volcanic islands</td>
<td>Hawaii</td>
</tr>
</tbody>
</table>

2. **Weathering – “breaking down”**

   a) Mechanical Weathering:
      - Rock breaks into smaller pieces (sediment)
      - Caused by water, ice crystals, plant roots, fire, humans
      - Creates plains, plateaus, valleys, straits, canals
   b) Chemical Weathering:
      - Rock decays or changes form
      - Caused by air and water
      - Examples: rust and acid rain

3. **Erosion – “moving and changing”**

<table>
<thead>
<tr>
<th>CAUSE</th>
<th>EFFECT</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water—flowing in a river or ocean waves</td>
<td>Carries sediment downstream and deposits it at mouth of river;</td>
<td>Delta, Valley</td>
</tr>
<tr>
<td></td>
<td>Cuts away at sides &amp; downward; Dissolves and changes rocks; Increases or decreases coastline</td>
<td>Canyon, Peninsula, Bay</td>
</tr>
<tr>
<td>Glaciers—mass of ice that slowly glides down mountains because of gravity</td>
<td>Flattens everything; Leftover ice leaves depressions in the ground</td>
<td>Plains, Valleys, Lakes</td>
</tr>
<tr>
<td>Wind—carries fine sediment; big impact if no plants around</td>
<td>Breaks down and polishes rocks Moves sediment (sand/clay)</td>
<td>Sand Dunes</td>
</tr>
</tbody>
</table>
## Global Climate Regions

<table>
<thead>
<tr>
<th>Climate Region</th>
<th>Location</th>
<th>Characteristics</th>
<th>Illustration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tropical Wet (Humid Tropical)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tropical Wet &amp; Dry (Savanna)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semiarid (Steppe)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Desert</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mediterranean</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marine West Coast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humid Subtropical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humid Continental</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subarctic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tundra</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## LAME COWS: Factors That Affect Climate

<table>
<thead>
<tr>
<th>Latitude</th>
<th>Continental Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>°N or °S of equator</td>
<td>Oceans are solar energy collectors</td>
</tr>
<tr>
<td>Equator = direct rays = hot</td>
<td>Because water heats &amp; cools more slowly than land…</td>
</tr>
<tr>
<td>Poles = very indirect rays = cold</td>
<td>1. Coastline has a stable temperature</td>
</tr>
<tr>
<td></td>
<td>2. Interior of continent has extreme temperatures (hotter &amp; colder)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Air Pressure</th>
<th>Ocean Currents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Caused by unequal heating of earth’s surface</td>
<td>1. Giant rivers of sea water flowing at surface of oceans</td>
</tr>
<tr>
<td>2. Low pressure = warm, moist air</td>
<td>2. Flow in circular paths:</td>
</tr>
<tr>
<td>→ rises &amp; forms clouds → storms</td>
<td>Warm currents carry water from low → high</td>
</tr>
<tr>
<td>3. High pressure = cold, dry air</td>
<td>latitudes,</td>
</tr>
<tr>
<td>→ sinks → stable and clear weather</td>
<td>Cool currents return cooled water from high → low latitudes.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mountain Barriers</th>
<th>Wind belts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rainshadow Effect: Mountains block wind and rain</td>
<td>“Wind” = movement of air from high pressure to low pressure (ex: poke a hole in a tire)</td>
</tr>
<tr>
<td>Windward side (Wet)</td>
<td>Trade Winds: high P (30°) → low P (0°)</td>
</tr>
<tr>
<td>Leeward side (Dry)</td>
<td>Westerlies: high P (30°) → low P (60°) carry weather across U.S. from west → east</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elevation</th>
<th>Storms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in elevation = Decrease in temperature</td>
<td>Occur during low pressure conditions.</td>
</tr>
<tr>
<td>↑ 1000 ft = ↓ 3.6°F</td>
<td>Storm front = when two air masses with different temperatures meet.</td>
</tr>
</tbody>
</table>

1. Thunderstorms: |
2. Tornadoes – formed along fronts |
3. Tropical storms (hurricanes) – formed in oceans |

```
Cold  Cool  Warm  Hot
```

The Geographic View of Our World 23
### Biomes Hook: Rainforest & Desert Concept Groups

Directions: Cut apart the squares and organize the pictures into two separate groups—things you might see in a rainforest and things you might see in a desert.

<table>
<thead>
<tr>
<th>Rainforest</th>
<th>Desert</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frog</td>
<td>Dune</td>
</tr>
<tr>
<td>Plant</td>
<td>Camel</td>
</tr>
<tr>
<td>Lizard</td>
<td>Sun</td>
</tr>
<tr>
<td>Spider</td>
<td></td>
</tr>
</tbody>
</table>