BUILDING BRIDGES

California Rocks!

Unit Profile

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Subject – Earth Science

Grade Level – 6th

Time Required – Total unit (Earth Science + Life Science lessons) = Up to16 class periods of 50 minutes each (6 lessons); one 4-hour field trip; two 1-hour videoconferences

Participating teachers have the option of completing the entire ***California Rocks!*** unit or, depending on time and budget constraints, selecting either the Earth Science focus (Lessons 1 – 5) or the Life Science focus (Lesson 6). Both focuses include one field trip to a local state park, and two videoconferences: an introductory ***Who We Are/Where We Are*** conference combined with a follow-up conference to explore and share the geologic history and/or the biodiversity of the park. Teachers may choose to incorporate both focuses into one park field trip or schedule a separate trip for each focus.

General Description – The ***California Rocks!*** unit will engage California students in researching plate tectonics and topography, ecosystems, and resources in their own communities. Students will share and compare their research with students in other communities and geographic regions of the state. As part of the California State Parks ***Building Bridges Project***, 6th grade students and their teachers will create partnerships with nearby State Parks. In a collaborative venture between classroom teachers and park rangers to teach earth science, rangers will visit participating local classrooms, and the classrooms will, in turn, visit the local state parks. The students will produce a series of multimedia presentations to be shared with a partner class via interactive videoconferences. Using the Digital California Project network (DCP), students will utilize the power of videoconferencing to teach each other about their local state parks, their communities, and themselves.

Standards

Science Content Standards (California) – Focus on Earth Science

Plate Tectonics and Earth's Structure

1. Plate tectonics explains important features of the Earth's surface and major geologic events. As a basis for understanding this concept, students know:

a. The fit of the continents, location of earthquakes, volcanoes, and midocean ridges, and the distribution of fossils, rock types, and ancient climatic zones provide evidence for plate tectonics.

c. lithospheric plates that are the rise of continents and oceans move at rates of centimeters per year in response to movements in the mantle.
f. how to explain major features of California geology in terms of plate tectonics (including mountains, faults, volcanoes).

Shaping the Earth's Surface

2. Topography is reshaped by weathering of rock and soil and by the transportation and deposition of sediment. As the basis for understanding this concept, students know:

a. water running downhill is the dominant process in shaping the landscape, including California's landscape.
b. Rivers and streams are dynamic systems that erode and transport sediment, change course, and flood their banks in natural recurring patterns.

Ecology (Life Science)

5. Organisms in ecosystems exchange energy and nutrients among themselves and with the environment. As a basis for understanding this concept, students know:

b. over time, matter is transferred from one organism to others in the food web, and between organisms and the physical environment.
c. populations of organisms can be categorized by the functions they serve in an ecosystem.
e. the number and types of organisms an ecosystem can support depends on the resources available and abiotic factors, such as the quantity of light and water, range of temperatures, and soil composition.

Resources

6. Sources of energy and materials differ in amounts, distribution, usefulness, and the time required for their formation. As basis for understanding this concept, students know:

a. different natural energy and material resources, including air, soil, rocks, minerals, petroleum, fresh water, wildlife, and forests, and classify them as renewable or nonrenewable.

Technology (ISTE NETS)

Standards:

1. Basic operations and concepts
2. Social, ethical, and human issues
3. Technology productivity tools
4. Technology communications tools
5. Technology research tools
6. Technology problem-solving and decision-making tools

Performance Indicators:

6th grade students will:

5. Apply productive/multimedia tools and peripherals to support personal productivity, group collaboration and learning throughout the curriculum. (3,6)

6. Design, develop, publish, and present products using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom. (4,5,6)
7. Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom. (2,4,5)

Lessons

The presentations by the park rangers, both in the classroom and in the park, will reinforce the sixth grade academic content standards for Earth Science and address important park themes. Prior to beginning the unit, the rangers and participating teachers will agree upon what material to present. Although they will have a great deal of freedom in determining the scope and sequence of the unit, it is important that partnered classes receive similar information so that their presentations will be comparable in depth and content. Lessons 1 – 5 address Earth Science standards; Lesson 6 addresses Life Science standards.

Assessment Note: To help document students' progress in meeting California Content Standards in Science, begin the unit by administering the *Pre-Assessment for* ***California Rocks!*** (Attachment 1)You may want to administer the *Post-Assessment for* ***California Rocks!*** (Attachment 14) at the end of the unit, or administer the appropriate section of the assessment (e.g., Plate Tectonics, Earth's Resources, Ecology) after students have completed the corresponding lesson(s).

A Focus on Earth Science – Lessons 1 - 5

Lesson One – Meet Your Local Park Ranger
In this first classroom visit, park rangers will introduce themselves and explain what the students will be learning through their participation in the ***Building Bridges Project.*** Not only will the students be actively learning about science, but they will also have the opportunity to share their knowledge with a partner class. This dialogue will take place through videoconferencing.

The rangers will explain and demonstrate the use of digital cameras and PowerPoint presentations. They will also describe the structure of an effective multimedia presentation in preparation for the first videoconference.

Length of lesson: Two 50-minute class periods

Objectives:
Students will demonstrate their understanding of effective content-rich multimedia presentations by use a scoring guide to rate sample PowerPoint presentations.

ISTE NETS: 1; 2; 3; 4

Materials:
- Digital camera, LCD projector, laptop computer, screen, Microsoft PowerPoint

Procedure:
Day One: Rangers will introduce and provide hands-on activities on the use of digital cameras, along with PowerPoint basics:
- Importing images from a digital camera into a PowerPoint presentation
- Adding, editing, and rearranging text in a slide
- Adding transitions and animations
- Creating a consistent theme
- Saving a presentation

During this session, students will also practice using the *Scoring Guide for an Effective PowerPoint Presentation* by evaluating a sample presentation provided by the park ranger.

Day Two: Students will have hands-on time to team up and create a sample PowerPoint presentation. The park ranger will assist the classroom teacher and provide additional whole-class, group, and individual instruction as needed.

Additional Resources:
Online Resources:
- Microsoft's Actden Tutorial for PowerPoint in the Classroom - http://www.actden.com/pp/
- Anecdotes for PowerPoint Poisoning - http://www.fno.org/sept00/powerpoints.html

Assessment: Refer to *Scoring Guide for an Effective PowerPoint Presentation* (Attachment 2).

Lesson Two – Who We Are/Where We Are
In this lesson, students will apply the skills introduced in *Lesson One* (digital cameras/PowerPoint) by creating a PowerPoint presentation to introduce themselves, their school, and their community to their partner classroom.

Length: Three to Four class periods of 50 minutes each

Objectives:
Students will create a PowerPoint presentation to demonstrate their proficiency with multimedia tools and production strategies.

ISTE NETS: 1; 2; 3; 4; 6

Materials:
- Digital camera, LCD projector, laptop computer, screen, Microsoft PowerPoint

Procedure:
Prior to beginning *Lesson Two*, ask students to bring an artifact to include in their snapshot that tells something about themselves, for instance, their interests, background, hobbies or life goals.

Day One: Pair up students and ask them to take a photo snapshot of each other. Once individual photographs have been inserted into the PowerPoint, each student is responsible for inputting three autobiographical items to accompany his/her snapshot.

Day Two: Team up students in groups of 3 or 4. Each team is responsible for gathering photographs that tell something about the history of their school and community. Their images should provide information on their location within the state, their community, and their school site.

Depending on the location of the school, you may want to organize a walking field trip of the neighborhood, organize a bus field trip, or simply use images already online, for example, from a chamber of commerce, realtor, or local government agency website. If time is limited, you may want to skip ***Day Two*** and offer extra credit for students who document their communities outside the school day.

Day Three: After all teams have submitted their top photo picks, have students rank their choices and explain their reasoning. The top six photographs (three for their school; three for their community) will be incorporated into their PowerPoint presentation. As a whole-class or group activity, guide students through the process of writing a concise, "bulleted" narrative for each photograph. Discuss the importance of maintaining a consistent voice (e.g., first person singular/plural) and verb tense (e.g., present tense) throughout the presentation.

Day Four: Print and distribute to each student a copy of the *Scoring Guide for an Effective PowerPoint Presentation* (Attachment 2). Run through the ***Who We Are/Where We Are*** presentation once and have students score the presentation. Compare their rankings. If necessary, play the presentation again. Discuss any discrepancies in scoring and share suggestions for improving the presentation.

Additional Resources:

- ***Online Resources:***
  - Microsoft's Actden Tutorial for PowerPoint in the Classroom - http://www.actden.com/pp/
  - Anecdotes for PowerPoint Poisoning - http://www.fno.org/sept00/powerpoints.html

Video Conference 1 – Classes and participating park rangers will share their ***Who We Are/Where We Are*** PowerPoint presentations. Rangers will join their partner classrooms for this introductory presentation.

Assessment – Refer to *Scoring Guide for an Effective PowerPoint Presentation* (Attachment 2) and *Scoring Guide for a Research Videoconference* (Attachment 3).

Lesson Three – Shake, Rattle, 'n Roll: A Look at Plate Tectonics
In this lesson, students will use real time earthquake data to investigate the connection between plate tectonics and earthquakes.

Length: One class period of 50 minutes, plus an ongoing two-week tracking of USGS's (United States Geologic Survey) Earthquake Bulletin website

Objectives: To provide a foundation for the study of plate tectonics, students will use a map of the continents and flipbooks that show the breakup of Pangea to observe and make inferences about the movement of landmasses.

California Science Content Standards – Plate Tectonics: 1a, 1c, 1f
ISTE NETS: 1; 3; 5; 6

Day One: Continents on the Move – As a warm-up activity, students will attempt to piece current continents together in order to reconstruct the theoretical, prehistoric landmass known as Pangea. After completing the puzzle activity, students will create flipbooks and observe the motions of plates over time.

Materials:
- Glue sticks, construction paper
- Pangea Cutouts handout (Attachment 4) and Super Continent Flipbook (Attachment 5) – These pages may be reproduced for non-profit educational uses only (University of California, Irvine, *California Science Implementation Network*).

- If you would prefer hardcopies, ***Continental Drift Flipbooks*** are available from Geosociety, University of Texas at Arlington (P0 Box 19049, Arlington TX 76019).

Procedure:
Warm-up Activity - Distribute copies of Pangea cutouts to students. Direct students to cut out continents and piece them together into one landmass. When they are satisfied with their arrangement, they should glue their arrangement onto a piece of construction paper. Ask students to write a minimum of three sentences describing the reasoning behind their arrangements.

Have students display their models for all to see. As a whole class discussion, identify areas of agreement and disagreement.

Flipbook Activity - Distribute flipbook handouts. Have students cut out flipbook pages and arrange them from present to 190 million years ago, and carefully staple the top edge of the booklet. Tell students to hold their booklets along the left side and begin flipping through the frames, observing changing positions of landmasses. They are reconstructing the breakup of Pangea and the movement of landmasses over 190 million years, arriving at the present-day configuration of our continents.

Question: Why does our world look like what it looks like today? What is the connection between Pangea and the movement of landmasses in their flipbooks? On the back of their Pangea map, or an a separate piece of paper, direct students to write 3 to 5 sentences explaining their observations about the movement of continents.

Assessment – Refer to *Scoring Guide for Flipbook* (Attachment 6).

Day Two Follow-up Activity – Assign student groups to investigate the additional online sites listed below and report what they learned about our changing earth.

Additional Resources

- ***Online***
  - What on Earth Is Plate Tectonics? - http://wrgis.wr.usgs.gov/docs/usgsnps/pltec/pltec1.html
  - Understanding Plate Motions - http://pubs.usgs.gov/publications/text/understanding.html
  - Plate Tectonics - http://scign.jpl.nasa.gov/learn/plate.htm
  - On the Move - http://kids.earth.nasa.gov/archive/pangaea/
  - Earth Floor - http://www.cotf.edu/ete/modules/msese/earthsysflr/plates1.html
  - Discovering Plate Boundaries - http://www.geophysics.rice.edu/plateboundary/TGpart1_notes.pdf
  - This Dynamic Earth: The Story of Plate Tectonics - http://pubs.usgs.gov/publications/text/dynamic.html
  - Color-Coded Continents - http://wrgis.wr.usgs.gov/docs/usgsnps/pltec/scplseqai.html

Lesson Bridge – At this point, students are ready to become familiar with the vocabulary and theories associated with plate tectonics. You may incorporate your science textbook and/or the sources listed below to expand and reinforce background knowledge.

Additional Resources

- ***Online***
  - What on Earth Is Plate Tectonics? - http://wrgis.wr.usgs.gov/docs/usgsnps/pltec/pltec1.html
  - Understanding Plate Motions - http://pubs.usgs.gov/publications/text/understanding.html
  - Plate Tectonics - http://scign.jpl.nasa.gov/learn/plate.htm
  - On the Move - http://kids.earth.nasa.gov/archive/pangaea/
  - Earth Floor - http://www.cotf.edu/ete/modules/msese/earthsysflr/plates1.html
  - Discovering Plate Boundaries - http://www.geophysics.rice.edu/plateboundary/TGpart1_notes.pdf
  - This Dynamic Earth: The Story of Plate Tectonics - http://pubs.usgs.gov/publications/text/dynamic.html
  - Color-Coded Continents - http://wrgis.wr.usgs.gov/docs/usgsnps/pltec/scplseqai.html

- ***In Print***

- *This Dynamic Earth: The Story of Plate Tectonics* – US Geological Survey, Map Distribution, Federal Center, PO Box 25286, Denver CO 80225 (also available online – http://pubs.usgs.gov/publications/text/dynamic.html)
- *The Dynamic Earth – An Introduction of Physical Geology* – Brian J. Skinner and Stephen C. Porter, John Wiley & Sons 1989 ISBN 0-471-60618-9 (a good general reference book for earth science)
- *The Restless Earth – The Secrets of Earthquakes, Volcanoes, and Continental Drift in 3-Dimensional Movie Pictures* – Francois Michel and Yves Larvor - Penguin Books 1990 ISBN 0-670-83661-4 (an excellent visual reference for students)
- *The Raging Planet* – Bill McGuire, Quarto 2002 ISBN 0-7641-1969-9 (visually outstanding and engaging)

• ***Video***
Continental Drift and Plate Tectonics – Tanya Atwater 20-minute videotape (Contact Geology Department, UC Santa Barbara)

Concurrent Activity: To connect plate tectonics to what students will see on their field trip, the study of earthquakes should be introduced at this time. To begin this study, have students plot current earthquake activity using data from the USGS Earthquake Bulletin http://neic.usgs.gov/neis/bulletin/bulletin.html. Students will need a handout of a world map with latitude and longitude coordinates. National Geographic's Xpeditions site is a good source of reproducible maps: http://www.nationalgeographic.com/xpeditions/atlas/.

Students should visit the USGS website daily over a two-week period in search of earthquakes 3.0 or larger on the Richter Scale that have occurred over the last few days. They will use the latitude and longitude coordinates to plot points of intersection on their maps that represent the epicenter of the earthquake. They should use one color if the earthquake occurred near the surface (less than 100 km) and another color if it occurred deep (greater than 100 km) in the earth. The longer students are allowed to track earthquake activity, the more correlation they will discover to actual plate boundary lines. Ideally, allow up to two weeks for tracking. If your students have limited access to computers on a daily basis, you may want to print out and provide them with a copy of the Earthquake Bulletin each morning.

Question: Are there any fault lines running through or near your state park?

Resources:
- Recent Earthquakes in California and Nevada - http://quake.wr.usgs.gov/recenteqs/
- Life Along the Fault Line - http://www.exploratorium.edu/faultline/
- Earthquake Hazards Program - http://gldss7.cr.usgs.gov/neis/time/time.html

Lesson Four – It's Not My Fault – A Look at Earthquakes
In this lesson, students will construct and manipulate a three-dimensional paper model of a block of faulted earth in order to distinguish among the three major types of faults and to observe typical surface and subsurface changes caused by an earthquake. *Note:* this lesson was adapted with permission from the UCI/CSIN (UC Irvine's California Science Implementation Network).

Objective: Students will complete a worksheet to demonstrate understanding of the three major fault types.

California Science Content Standards – Plate Tectonics: 1a; 1c; 1f

Length: One class period of 50 minutes

Materials:
- Crayons or colored markers, scissors, tape
- *It's Not My Fault Cutout Model* (Attachment 7) and *It's Not My Fault Worksheet* (Attachment 8)

Procedure:
Distribute the materials. Have students carefully read the *It's Not My Fault Worksheet* before beginning. Refer them to the directions on the worksheet. Students should complete all assigned tasks and write corresponding responses as they proceed.

Assessment – Worksheet could be scored on total points or with the *Scoring Guide for It's Not My Fault Worksheet* (Attachment 9).

Field Trip – Before leaving on the field trip, students should be divided into three separate focus groups. Their task will be to photograph and document one of three specific areas:
- **Group One Focus: Geologic History of the Park** - As the park ranger shares the park's unique geologic features, students in Group One will photograph evidence of the major topographic features of the park, cataclysmic earth processes that have shaped its surface, predominant soil types found in the park, and evidence of the forces of erosion and deposition within the park.
- **Group Two Focus: Biodiversity of the Park** - Students in Group Two will photograph predominant plant communities in the park to teach about energy flow, producers, population functions, and food webs. They will also document the ecological roles the park's animals play in transferring matter over time from one organism to others in the food web.
- **Group Three Focus: California State Parks, the Living Classrooms** – Students in Group Three will photograph evidence of the park's renewable and non-renewable resources.

Lesson Five – California State Parks – Our Living Classrooms
Following the field trip, the students will incorporate the field trip photos from both the *Geologic History* and *Renewable and Non-renewable Resources* into a PowerPoint presentation that will later be shared with their partner classroom through an interactive videoconference.

Length: Four 50-minute class periods

Objective:
Students will demonstrate their understanding of geologic theories and principles by designing a content-based multimedia presentation.

California Science Content Standards – Plate Tectonics: 1a, 1c, 1f; Shaping the Earth's Surface: 2a, 2b: Resources: 6a
ISTE NETS – 1, 2, 3, 4, 5, 6

Materials:
Digital camera, LCD projector, laptop computer, screen, Microsoft PowerPoint

Procedure:
Day One: As a whole-class activity, ask students to brainstorm the content and number of PowerPoint slides needed to show the *geologic history* and *renewable and non-renewable resources* of their local state park. Depending on the number of slides to be included, assign individual students, pairs, or groups to a specific slide. Include a discussion of consistent style (e.g., number of graphics per slide, number of bulleted items per slide, narrative elements, etc.).

Day Two: Allow for research time. If possible, schedule your class in a computer lab where students can team up and investigate the online resources.

Day Three (or as a homework assignment following Day Two): Before the students create their actual PowerPoint slides, they will first complete a draft of their layout and content using the *PowerPoint Storyboard* (Attachment10). As soon as the students/teams have completed their storyboards, pin them to a bulletin board, agree on the sequence of slides, number each storyboard slide accordingly, and return them to the students. They are now ready to create their PowerPoint presentation.

Note: Depending how many slides individual students are responsible for, or to conserve paper, you may wish to have students complete their storyboards on the *Group PowerPoint Storyboard* (Attachment 11).

Day Four: Once students/teams have completed their slides, have them practice the presentation, using the *Scoring Guide for Our Living Classrooms PowerPoint Presentation* (Attachment 12).

Extension Activity – Have students create a labeled topographic or relief map to show the landforms present at their local state park.

Additional Resources
- ***Online***

  Geologic History
  - Landforms - http://nbsp.sonoma.edu/resources/teachers_materials/earth_03/CAlandforms_files/frame.htm

- Color Landform Atlas - http://fermi.jhuapl.edu/states/ca_0.html
- NASA's Visible Landforms - http://visibleearth.nasa.gov/Land_Surface/Topography/Landforms_6.html
- Soil Science Education Page - http://ltpwww.gsfc.nasa.gov/globe/index.htm

Renewable and Non-renewable Resources

- Nonrenewable Energy - http://www.eia.doe.gov/kids/non-renewable/nonrenewable.html
- Nonrenewable Resources - http://www.lausd.k12.ca.us/NH_Zoo_Magnet/power_trip/nonrenewable_resources.html

- ***In Print***
  - *How the Earth Works* – Dorling Kindersley Limited 1992 ISBN 0-89577-411-9 (very readable with lots of hands-on activities for home or the classroom)

Video Conference #2 – Using their PowerPoint presentations, students will teach their partner class about the geologic history of their local state park.

Assessment – Refer to *Scoring Guide for Our Living Classrooms PowerPoint Presentation* (Attachment 12) and *Scoring Guide for Research Video Conference* (Attachment 3).

A Focus on Life Science – Lesson Six

Lesson Six – A-Z Field Guide of Park Resources and Ecology

In this lesson, the class will create a PowerPoint presentation to showcase the biodiversity of their park. Using the format of an A-Z book, the class will develop a slide show that is organized alphabetically. For instance, the "A" slide might be for "arthropods," "amphibians," "alluvial fan," "algae," or any feature/creature starting with the letter "A" that plays a part in the ecology of their park. The presentation could also include slides on the location and history of the park, food chain diagrams, and resources.

Length: Three 50-minute class periods

Objective: Students will demonstrate their understanding of biodiversity in a specific ecosystem by designing a content-based multimedia presentation.

California Science Content Standards – Ecology: 2a, 2b
ISTE NETS – 1, 2, 3, 4, 5, 6

Materials:
Digital camera, LCD projector, laptop computer, screen, Microsoft PowerPoint

Procedure:
Day One: On the chalk board/white board, list the letters of the alphabet. As a whole-class activity, ask students to brainstorm the content that should be included in their PowerPoint

presentation to teach others about the biodiversity present in their park. Agree on what additional slides could be added. Students could signup to create specific slide(s). They should start the process by completing a *PowerPoint Storyboard* (Attachment 10).

Note: Depending how many slides individual students are responsible for, or to conserve paper, you may wish to have students complete their storyboards on the *Group PowerPoint Storyboard* (Attachment 11).

Day Two: Pin the students' storyboards to a bulletin board. As a whole-class activity, agree on the placement of the additional slides beyond the 26 A-Z slides. Include a discussion of consistent style (e.g., number of graphics per slide, number of bulleted items per slide, narrative elements, etc.). Give students the remainder of the period to work on their presentation. If there is time, begin practicing the presentation.

Day Three: Practice the presentation, using the *Scoring Guide for an A-Z PowerPoint Presentation* (Attachment 13).

If time and budget permit, plan a third videoconference with the partner class. Otherwise, post the presentation online and/or present to another classroom within your school site.

Additional Resources

- ***Online***
  - Ecosystems, Biomes, and Habitats - http://www.fi.edu/tfi/units/life/habitat/habitat.html
  - The Food Chain - http://library.thinkquest.org/11353/food.htm
  - EPA Ecosystems - http://www.epa.gov/students/ecosyste.htm

- ***In Print***
  - *How Nature Works* – Dorling Kindersley Limited 1991 ISBN 0-89577-391-0 (very readable with lots of hands-on activities for home or the classroom)

Video Conference #3 (Optional) **–** Using their *A-Z PowerPoint Presentation*, students will teach their partner class about biodiversity of their state park.

Assessment – Refer to *Scoring Guide for an A-Z PowerPoint Presentation* (Attachment 13) and *Scoring Guide for Research Video Conference* (Attachment 3).

Final Assessment for California Rocks! Unit – Refer to *Post-Assessment for California Rocks! Unit* (Attachment 14).

Pre-Assessment for Geology Rocks! Unit (Attachment 1)

Plate Tectonics

1. Describe the theory of continental drift.

2. Describe the theory of plate tectonics.

3. Identify the main layers of the earth and state the evidence of their existence.

4. Explain the connection between earthquakes and plate tectonics

5. Explain the three main types of fault lines.

Earth's Resources

1. Define the term ***earth's resources***.

2. Explain the difference between a ***renewable*** and ***non-renewable*** resource. Give examples for each one.

Ecology

1. Define the term ***ecosystem***.

2. Explain what factors determine the number and types of organisms in an ***ecosystem***.

3. On the back of this page, draw and label a diagram of a life cycle.

Scoring Guide for an Effective PowerPoint Presentation (Attachment 2)

4 Exemplary (Exceeds the Standards)

- Presentation meets all criteria for Proficient, plus:
- Introduction presents overall topic in a way that draws the audience into the presentation
- Layout is visually outstanding
- Graphics, sound, and/or animations enhance the content
- Writing Mechanics – Written text of presentation contains no errors in grammar, capitalization, punctuation, and spelling

3 Proficient (Meets the Standards)

- Storyboard shows evidence of pre-production planning
- Introduction is clear, coherent, and relates to the topic
- Content is written with a logical progression of ideas and supporting information
- Layout is visually pleasing, has a consistent theme, and contributes to the overall message with appropriate use of headings, subheadings, and white space
- Graphics, sound, and/or animals assist the audience in understanding the content
- Text elements
    - fonts are easy to read
    - background and colors enhance the readability of text
    - text is concise and appropriate in length for the target audience
- Writing Mechanics – Text is clearly written and requires little editing for grammar, punctuation, and spelling

2 Progressing (Towards the Standards)

- Presentation meets at least five of the criteria for Proficient
- Presentation needs more work

1 Not Yet Meeting the Standards

- Presentation meets less than five of the criteria for Proficient
- Presentation lacks content and/or focus
- Presentation should be redone

Scoring Guide for Research Videoconference (Attachment 3)

4 Exemplary (Exceeds the Standards)

- Criteria for Proficient have been met
- Student's comments and responses provide evidence of research and understanding of subject matter beyond the textbook and classroom presentations

3 Proficient (Meets the Standards)

- Presentation
  - Eye Contact – Student maintains direct eye contact with audience (camera) throughout presentation, with minimal reading of notes
  - Delivery – Student delivers introductory and closing remarks that capture and keep the attention of the audience
  - Pacing – Student speaks clearly and varies voice in volume, tone, and pacing
  - Posture – Student's posture and movements are not distracting to audience
- Etiquette
  - Student demonstrates active listening skills throughout video conference
  - Student respects and follows any video conference guidelines provided by instructors and/or technicians
  - Student uses all video conference equipment appropriately

2 Progressing (Towards the Standards)

- Presentation – Student may need more work on talking to audience (e.g., less reading of presentation, more eye contact, more expression in voice and body movements)
- Etiquette – Student may have needed a reminder of appropriate video conferencing guidelines and/or procedures

1 Not Yet Meeting the Standards

- Student was not prepared for video conference
- Student failed to follow video conference guidelines and/or procedures

(Attachment 4)

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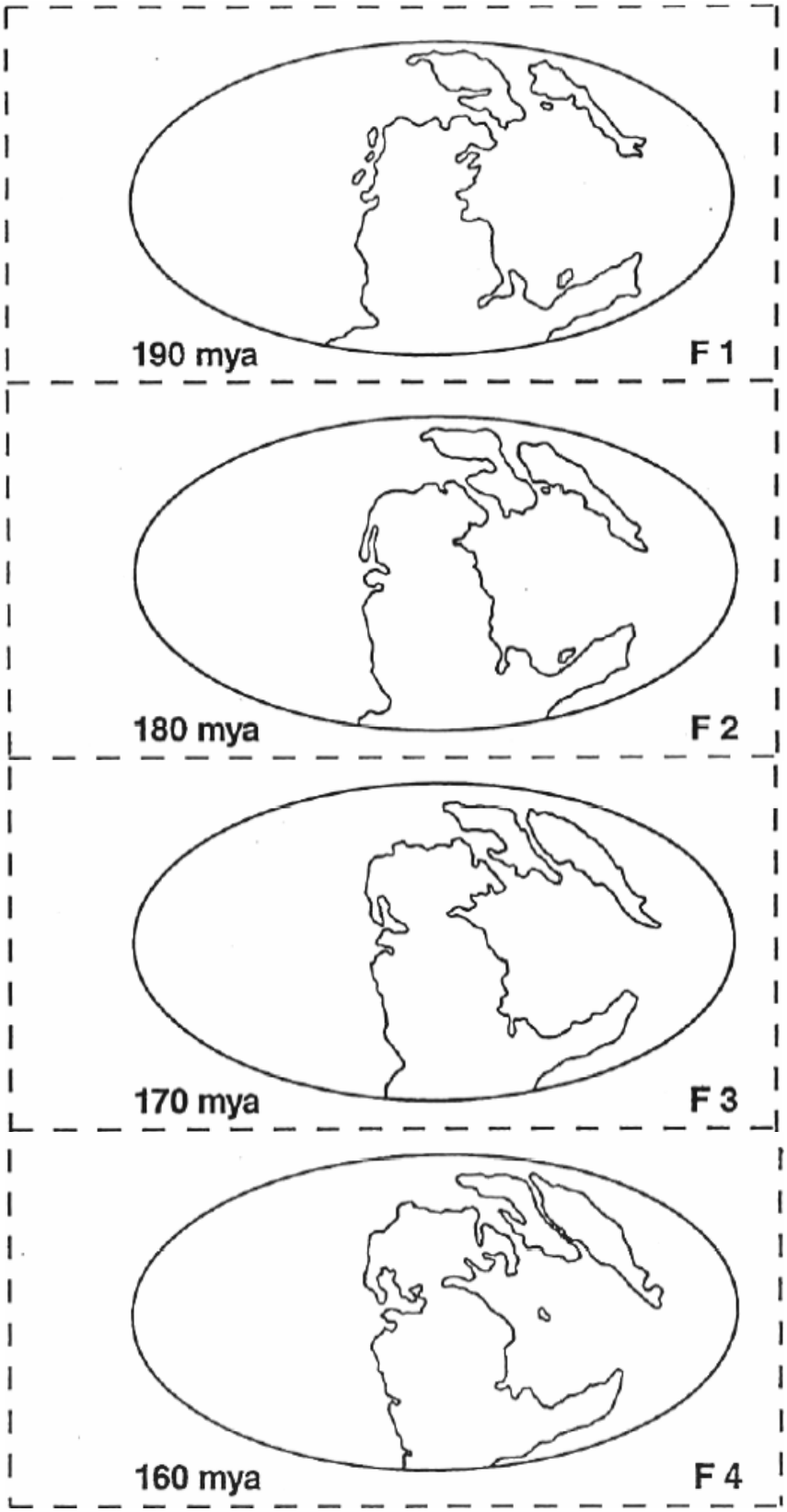

Figure 1. Frames F1 through F20 showing the configuration of the continents on a projection of the Earth (the equator would be a horizontal line through the middle of the map; the prime meridian would be a vertical line through the center of the map) from 190 million years ago (mya) through the present. A. Frames F1 to F4. B. Frames F5 to F8. C. Frames F9 to F12. D. Frames F13 to F16. E. Frames F17 to F20.

Figure 1A.

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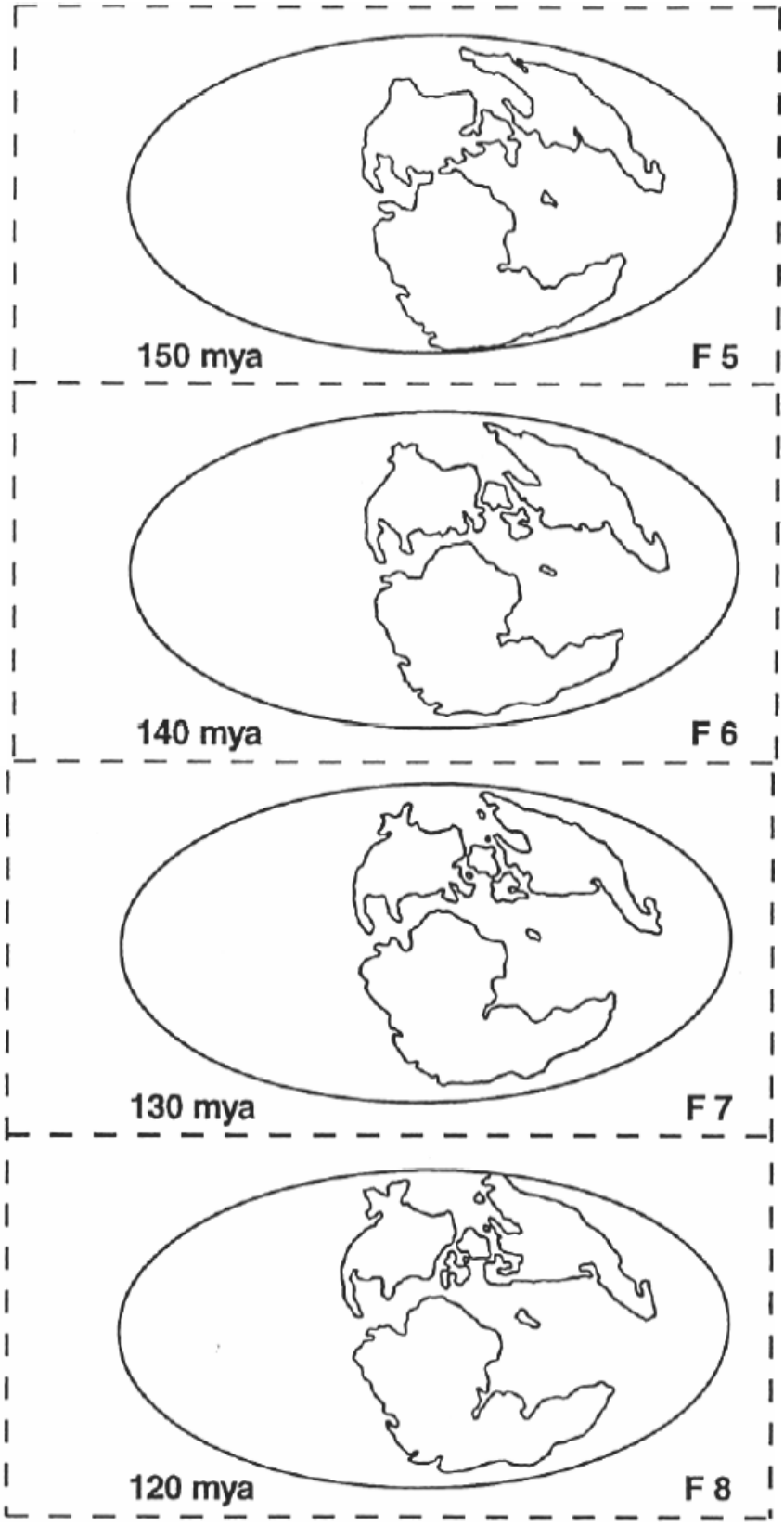

Figure 1. Frames F1 through F20 showing the configuration of the continents on a projection of the Earth (the equator would be a horizontal line through the middle of the map; the prime meridian would be a vertical line through the center of the map) from 190 million years ago (mya) through the present. A. Frames F1 to F4. B. Frames F5 to F8. C. Frames F9 to F12. D. Frames F13 to F16. E. Frames F17 to F20.

Figure 1B.

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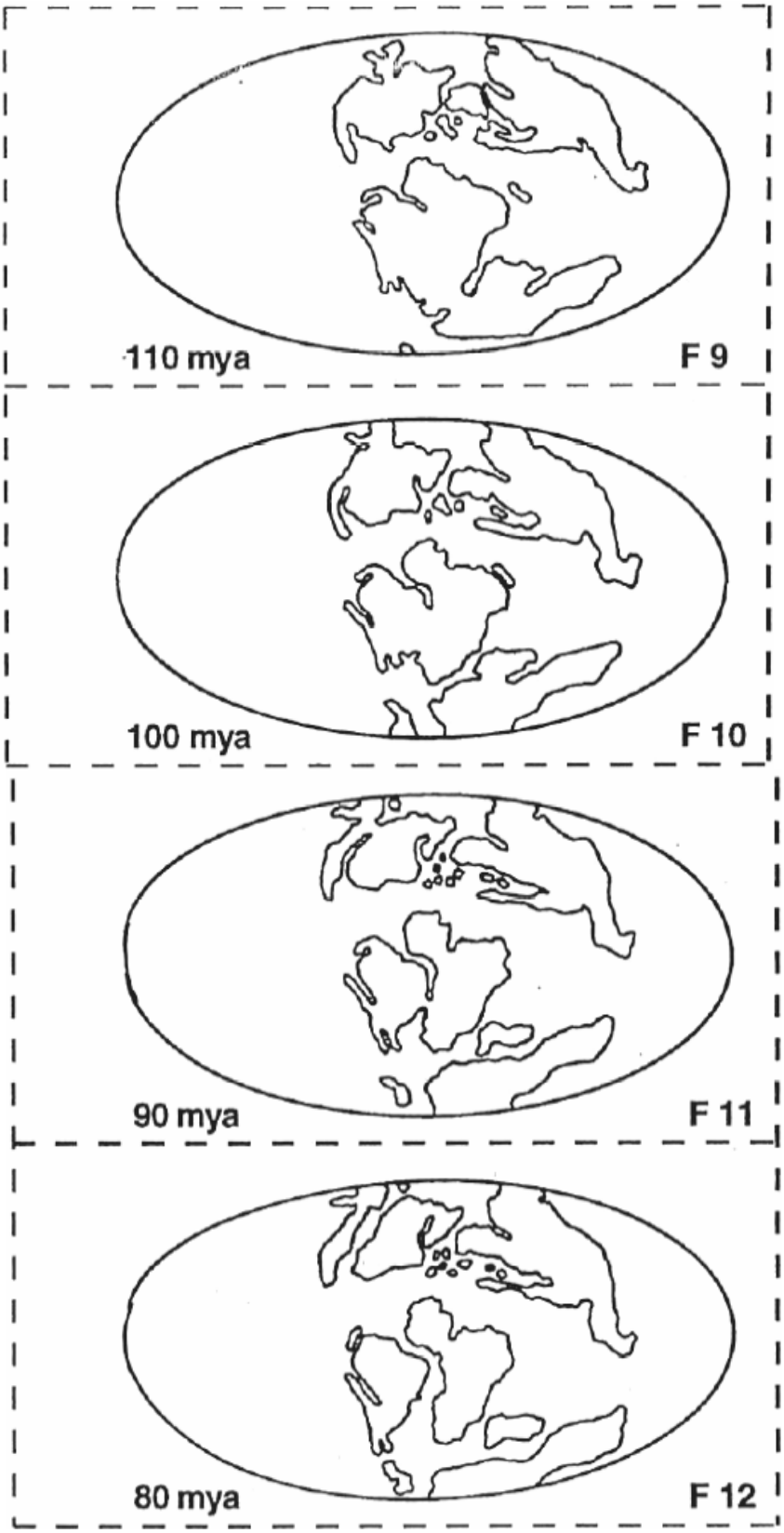

Figure 1. Frames F1 through F20 showing the configuration of the continents on a projection of the Earth (the equator would be a horizontal line through the middle of the map; the prime meridian would be a vertical line through the center of the map) from 190 million years ago (mya) through the present. A. Frames F1 to F4. B. Frames F5 to F8. C. Frames F9 to F12. D. Frames F13 to F16. E. Frames F17 to F20.

Figure 1C.

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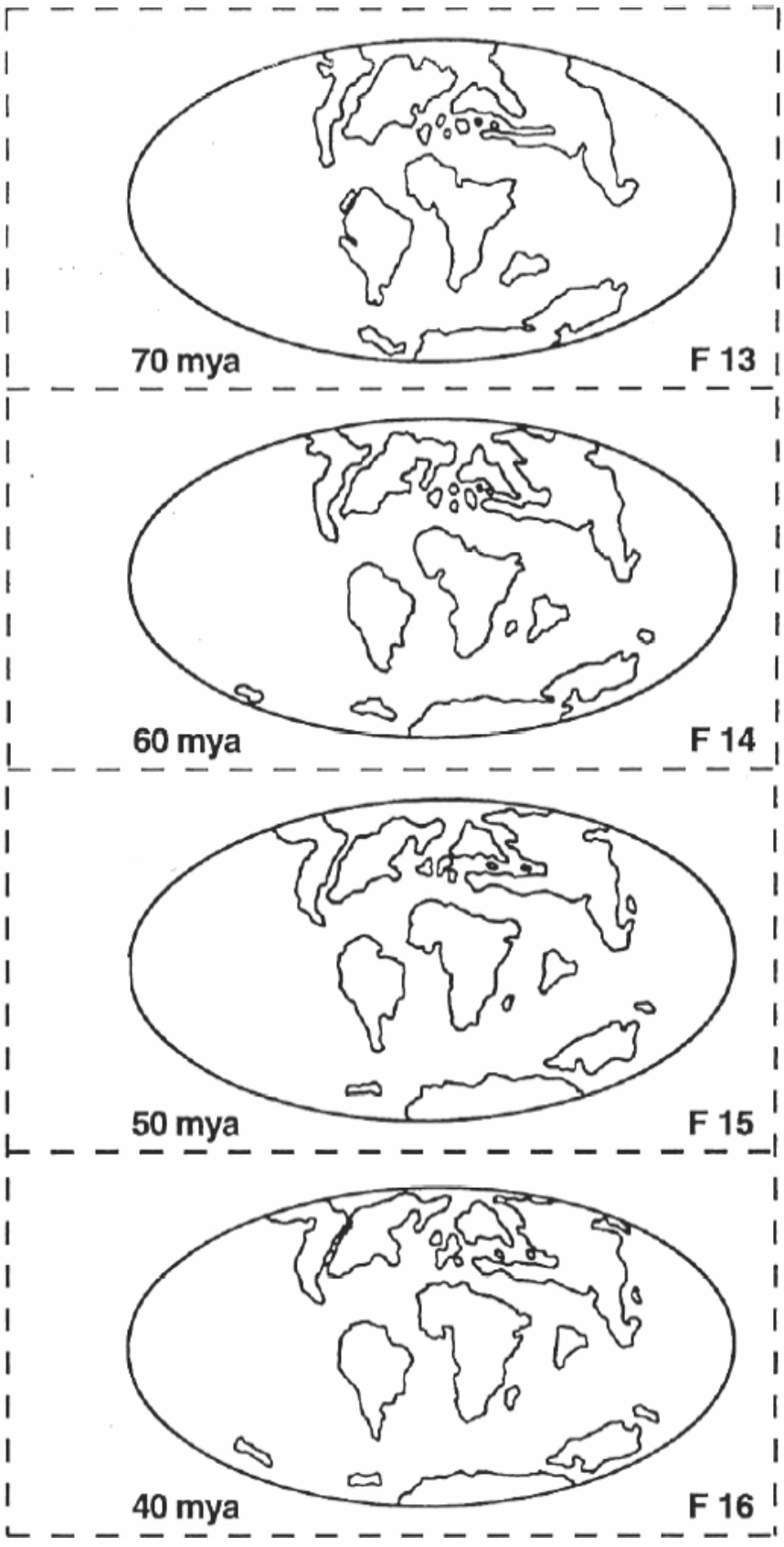

Figure 1. Frames F1 through F20 showing the configuration of the continents on a projection of the Earth (the equator would be a horizontal line through the middle of the map; the prime meridian would be a vertical line through the center of the map) from 190 million years ago (mya) through the present. A. Frames F1 to F4. B. Frames F5 to F8. C. Frames F9 to F12. D. Frames F13 to F16. E. Frames F17 to F20.

Figure 1D.

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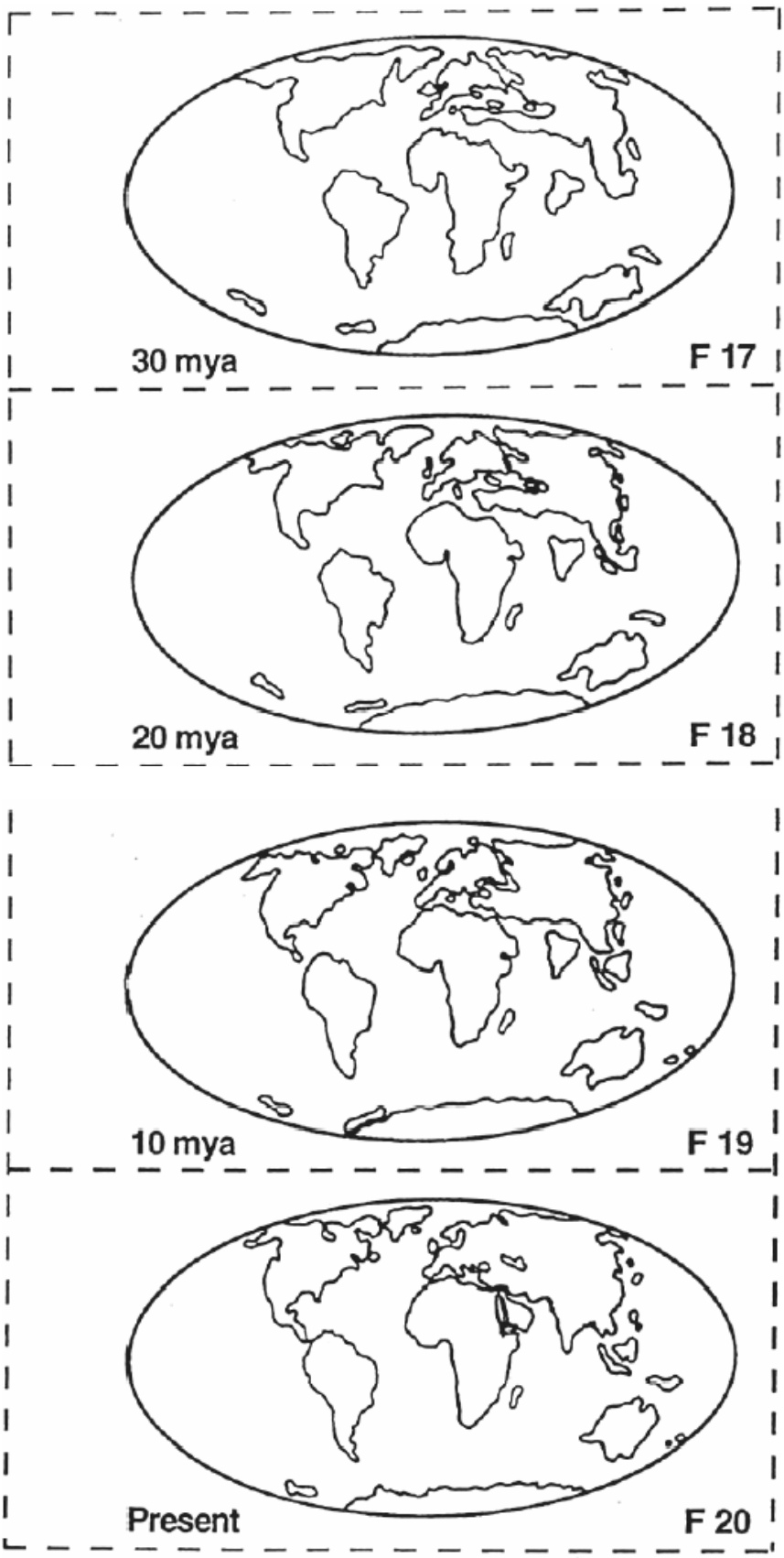

Figure 1. Frames F1 through F20 showing the configuration of the continents on a projection of the Earth (the equator would be a horizontal line through the middle of the map; the prime meridian would be a vertical line through the center of the map) from 190 million years ago (mya) through the present. A. Frames F1 to F4. B. Frames F5 to F8. C. Frames F9 to F12. D. Frames F13 to F16. E. Frames F17 to F20.

Figure 1E.

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Scoring Guide for Flipbook (Attachment 6)

4 Exemplary (Exceeds the Standard)

- Flipbook and Observation Sheet meet requirements for Proficient
- Observations and inferences are exceptionally detailed, using specific geographic vocabulary

3 Proficient (Meets the Standard)

- Flipbook is accurately and neatly assembled according to directions given
- Written observations contain a minimum of three to five inferences about the movement of land masses

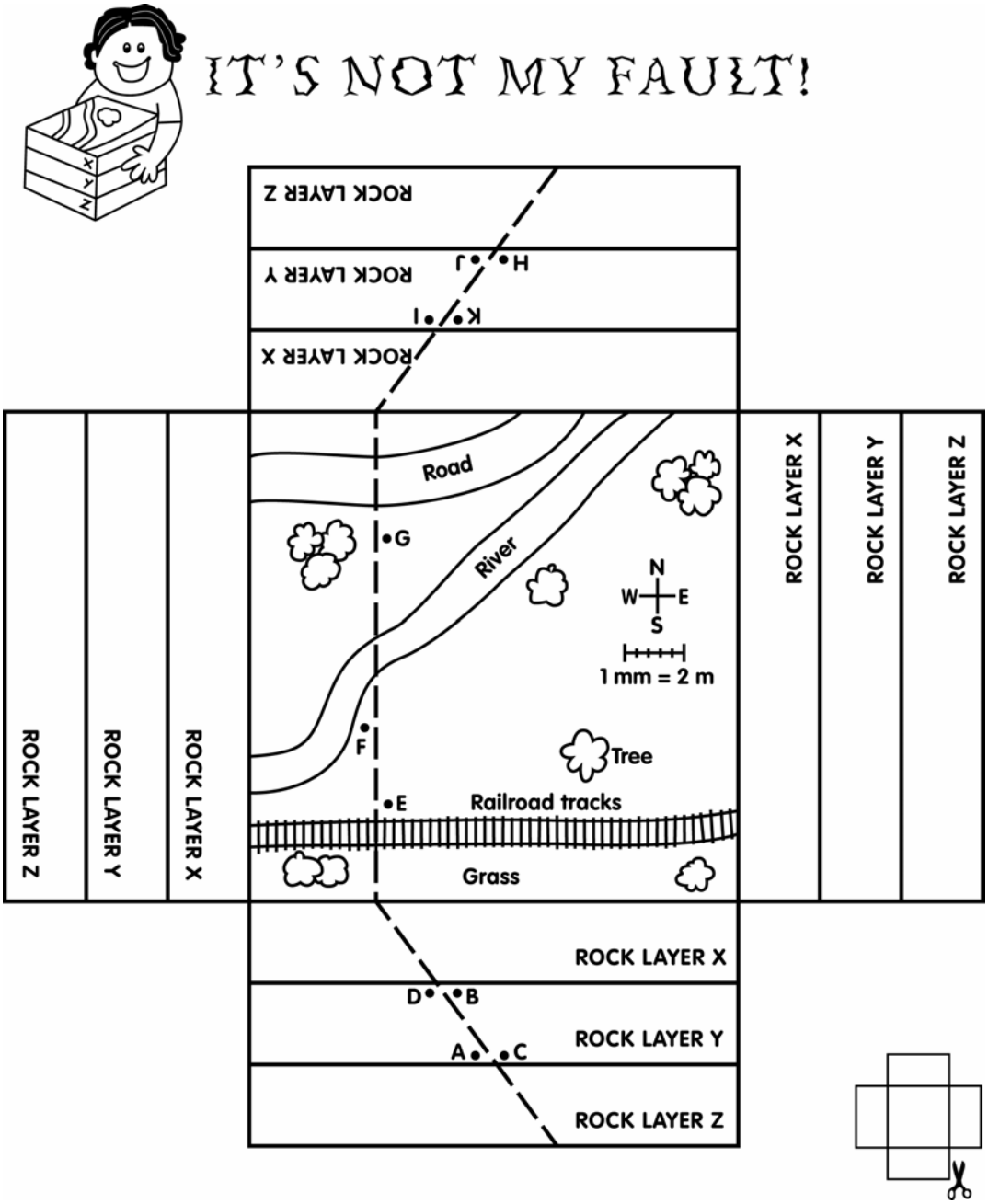
2 Progressing (Toward the Standard)

- Flipbook is accurately assembled
- Written observations contain a minimum of two inferences about the movement of land masses
- Observation Sheet needs more work

1 Not Yet Meeting the Standard

- Flipbook may be inaccurately assembled
- Observations are missing or lack content
- Assignment should be redone

(Attachment 7)



COLORING KEY
Rock layer X = green
Rock layer Y = yellow
Rock layer Z = red
River = blue
Train tracks = brown
Grass & trees = green
Road = grey or black

After coloring, cut along outside edge of the figure.

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It's Not My Fault Worksheet (Attachment 8)

Directions:

1. Color the fault model on the activity sheet following the color key printed on the Cutout Model Activity Sheet.

2. Cut out the fault model. Fold the rock layer extensions down to form a box with the features (trees, train track, river) on the top. Tape touching corners together. The box you make is a three-dimensional model of the top layers of the earth's crust.

3. The dotted lines on your model represent a FAULT. Carefully cut along the dotted lines. You should end up with two pieces.

4. Locate points A and B on your mode. Move the two pieces so that point A is next to point B. This represents a NORMAL FAULT.
    a. In the space below, draw how the rock layers X, Y, and Z now appear. Label this drawing NORMAL FAULT.

    b. Describe how the earth's surface has changed after movement along the normal fault.

    _____

    _____

    c. Predict what might happen to the river now that the rock layers have moved.

    _____

    _____

5. Locate points C and D on your model. Move the model so that point C is next to point D. Doing this represents a THRUST FAULT.

a. In the space below, draw in how rock layers X, Y, and Z now appear. Label this drawing THRUST FAULT.

b. Describe how the earth's surface has changed after movement along the thrust fault.

_____

_____

c. Predict how the landscape will change after the movement along the thrust fault.

_____

_____

6. Locate points E and F on your model. Move the model so that point E is next to point F. This represents movement along a LATERAL FAULT.
   a. Describe how the earth's surface has changed.

_____

_____

   b. Describe how rock layers X,Y, and Z have changed.

_____

_____

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Scoring Guide for It's Not My Fault Worksheet (Attachment 9)

4 Exemplary (Exceeds the Standard)
- Meets requirements for Proficient
- Answers contain outstanding or unique insights or connections

3 Proficient (Meets the Standard)
- Drawings are neatly and accurately done
- Written answers reflect thought and address the issue

2 Progressing (Toward the Standard)
- Work is complete
- Drawings are satisfactory

1 Not Yet Meeting the Standard
- Worksheet is incomplete and/or inaccurate
- Written answers lack relevance
- Assignment should be redone

PowerPoint Storyboard (Attachment 10)

Slide # _____ of _____

Slide Heading: _____

Statement #1: _____

Statement #2: _____

Statement #3: _____

Statement #4: _____

Statement #5: _____

Graphic: _____

Where is this graphic located (digital photo, scanned image, book, website, etc.)?

_____

Comments:

In the box below, sketch the layout for your slide. Show where the heading, subheading (if used), bulleted items, and graphic(s) will be placed.

Multiple Slides PowerPoint Storyboard (Attachment 11)

Your storyboard should include your text, name and location of graphic(s), URLs of any links. Number your slides or use arrows to show the order of your presentation.

Scoring Guide for Living Classrooms PowerPoint Presentation (Attachment 12)

4 Exemplary (Exceeds the Standards)

- Presentation meets all criteria for Proficient, plus:
- Introduction presents overall topic in a way that draws the audience into the presentation
- Content contains research beyond material presented in classroom presentations, textbook, and park visits
- Research sources are correctly cited at end of presentation
- Layout is visually outstanding
- Graphics, sound, and/or animations enhance the content
- Writing Mechanics – Written text of presentation contains no errors in grammar, capitalization, punctuation, and spelling

3 Proficient (Meets the Standards)

- Storyboard shows evidence of pre-production planning
- Introduction is clear, coherent, and relates to the topic
- Content:
    - historically and scientifically accurate
    - reveals an understanding of renewable and non-renewable resources of the park
    - explains the importance and benefits of the park
    - suggests actions students can take to preserve our state parks
    - written with a logical progression of ideas and supporting information
- Layout is visually pleasing, has a consistent theme, and contributes to the overall message with appropriate use of headings, subheadings, and white space
- Graphics, sound, and/or animals assist the audience in understanding the content
- Text elements:
    - fonts are easy to read
    - background and colors enhance the readability of text
    - text is concise and appropriate in length for the target audience
- Writing Mechanics – Text is clearly written and requires little editing for grammar, punctuation, and spelling

2 Progressing (Towards the Standards)

- Presentation meets at least five of the criteria for Proficient
- Presentation needs more work

1 Not Yet Meeting the Standards

- Presentation meets less than five of the criteria for Proficient
- Presentation lacks content and/or focus
- Presentation should be redone

Scoring Guide for A-Z Field Guide PowerPoint Presentation (Attachment 13)

4 Exemplary (Exceeds the Standards)

- Presentation meets all criteria for Proficient, plus:
- Introduction presents overall topic in a way that draws the audience into the presentation
- Content contains research beyond material presented in classroom presentations, textbook, and park visits
- Research sources are correctly cited at end of presentation
- Layout is visually outstanding
- Graphics, sound, and/or animations enhance the content
- Writing Mechanics – Written text of presentation contains no errors in grammar, capitalization, punctuation, and spelling

3 Proficient (Meets the Standards)

- Storyboard shows evidence of pre-production planning
- Introduction is clear, coherent, and relates to the topic
- Content:
    - historically and scientifically accurate
    - reveals an understanding of the biodiversity unique to the local park's ecosystems
    - written with a logical progression of ideas and supporting information
- Layout is visually pleasing, has a consistent theme, and contributes to the overall message with appropriate use of headings, subheadings, and white space
- Graphics, sound, and/or animals assist the audience in understanding the content
- Text elements:
    - fonts are easy to read
    - background and colors enhance the readability of text
    - text is concise and appropriate in length for the target audience
- Writing Mechanics – Text is clearly written and requires little editing for grammar, punctuation, and spelling

2 Progressing (Towards the Standards)

- Presentation meets at least five of the criteria for Proficient
- Presentation needs more work

1 Not Yet Meeting the Standards

- Presentation meets less than five of the criteria for Proficient
- Presentation lacks content and/or focus
- Presentation should be redone

Post-Assessment for Geology Rocks! Unit (Attachment 14)

Plate Tectonics

6. Describe the theory of continental drift.

7. Describe the theory of plate tectonics.

8. Identify the main layers of the earth and state the evidence of their existence.

9. Explain the connection between earthquakes and plate tectonics

10. Explain the three main types of fault lines.

Earth's Resources

3. Define the term ***earth's resources***.

4. Explain the difference between a ***renewable*** and ***non-renewable*** resource. Give examples for each one.

Ecology

4. Define the term ***ecosystem***.

5. Explain what factors determine the number and types of organisms in an ***ecosystem***.

6. On the back of this page, draw and label a diagram of a life cycle.