Topic Strand Project

A topic strand is a sequence of lessons related to one topic that is linked to the appropriate standards (Next Generation Science Standards and relevant Common Core (English or mathematics)). A strand is part of a larger unit that your students will one day experience. Each lesson in the strand aligns to the standard(s) and central focus. Each lesson builds on to the preceding lesson. In this way you are providing in depth experiences to your students and scaffolding their learning (Bransford, Brown, & Cocking, 2000).

Process of working on your topic strand

The development of your topic strand will unfold over the term. There will be three products that result from this development, Part one – Overview, Part two – one complete lesson plan, and Part three – the full strand. You will also participate in a one-on-one conference with me. Each of these experiences and some in-class strategies are designed to help you conceive, develop, and fine tune your topic strand while you develop as a teacher learning to teach and think like a teacher.

Overview of the Final Topic Strand

The following is an overview of the topic strand. It is provided so that you have some knowledge of all of its parts.

1. Standard(s) – Next Generation Science Standard(s) that best aligns with the topic of your strand and grade level.

2. Central Focus – State the concept(s) being taught (this is more than the skills or facts to be learned).

3. Rationale for your topic- State why is it important for students to learn this topic in science? State why is this important to students' future learning? State how studying this topic will enhance and relate to students' lives either now or in the future?

4. Alignment Outline- Illustrate how your strand's standard, central focus and lesson objectives are related.

5. Lesson Plans – Your topic stand contains <u>three</u> lesson plans that fit a typical class period for the grade level you have selected.

    A. Handouts/support materials – Please include copies of the handouts and/or worksheets, tests, and formative assessments that you will give to your students or use as resources for yourself. Cite, using APA style, the sources of each handout not created by you.

6. Differentiation – Develop ideas about differentiating the lessons. Select <u>one</u> of your three lessons and state how you will differentiate for above grade level learners, at grade level learners, and below grade level learners. This can be one type of

differentiation such as process differentiation, product differentiation, or content differentiation.

7. Appendix – Print outs of all sources used in developing the Topic Strand.

Bransford, J., Brown, A., & Cocking, R. (2000). *How people learn: brain, mind, and experience & school.* Washington, DC: National Academy Press.

Part One – Overview of your topic strand

Task 1. Your first task is to decide the grade level to focus on and what science topic you wish to work on. It is advisable that you select an area of science that is of interest to you. Then you need to validate that this area is one that is addressed in the Next Generation Science Standards. If it is, you are good to go with your topic, if not the standards will guide you to another area that may interest you.

Task 2. Think about the topic. Decide what the first day's introductory lesson would be. Then decide what would your students do on the second day. And third day?

Task 3. Determine what learning objectives you would have for each day.

Task 4. Aspects to address in your overview

The overview requires you to address these aspects:

A. Central Focus: Explain in detail the Central Focus of this topic strand. The central focus is the long-term goal that unites the learning targets (aka objectives). It does not have to be accomplished within the strand…that's because the strand is just a part of a larger unit.

B. Rationale/Context: State why is it important for students to learn this topic in science? State why is this important to students' future learning? State how studying this topic will enhance and relate to students' lives either now or in the future.

C. Alignment Outline – Illustrate how your strand's standard, central focus, and lessons lesson objectives are related.

D. Assessment – Select two of your objectives and describe how you would find out how well students succeeded at learning what is indicated in the objectives. You only need one assessment strategy for each objective.

E. References - List the web or book resources that helped you develop part one.

F. Source(s) of your strand idea - cite the source of your topic strand idea and attach copies of all sources used in developing the alignment plan

What you turn in for Part One – Overview

Headings you should use

I. Introduction that includes the grade level for which you are developing the strand. Information on why you are interested in the science topic.

II. Central focus

III. Rationale/Context

IV. Alignment outline

V. Assessment

VI. References

VII. Source(s) of your topic strand idea (attach all sources used in developing the alignment plan printed and attached as an appendix to part one).

Sample of the Central Focus

For the partial strand included in this packet the central focus is for students to use the science process skill through carrying out a science inquiry. Each of the lessons in the strand has students using several of the science process skills over several days as well as engaging in the process of inquiry.

The central focus for this topic strand states, "Students will use science process skills and science inquiry as they engage in a strand on the life cycle of plants." This is the central focus for all the lessons in the topic strand.

Here are some science and non-science examples of Central Focus statements

> "The central focus of this learning segment is to introduce genetic inheritance and Mendelian genetics to the students" (http://site.xavier.edu/hoganp1/PDFs/S2A4.pdf).
>
> The central focus of this learning segment is for students to explore human body systems and recognize the components and function of each system. A student from EDN 326.
>
> The purpose of this learning segment is for students to learn about a current event topic and describe how the topic applies to the energy unit. (A NCC student)
>
> The central focus of this lesson segment is for students to identify the main idea of a reading and find key details that support the main idea. (A NCC student)

Sample Alignment Outline

I. Next Generation Science Standards

3-LS1-1. Develop models to describe that organisms have unique and diverse life cycles, but all have in common birth, growth, reproduction, and death.
3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

A. Central Focus of Strand: Students will use science process skills and science inquiry as they engage in a strand on the life cycle of plants.

1. Lesson 1 objectives
    a. Through examining seeds students will be able to locate, and identify each part of a seed (aligned to 3-LS1-1)
    b. Students will write a prediction related to their inquiry project experiment (aligned to 3-LS31)

2. Lesson 2 objectives
    a. The students will describe and list what plants need in order to grow (aligned to 3-LS1-1, 3-LS3-1)

[And so on through the rest of the strand…]

Sample Assessment

Teachers often come up with several ideas but will select the one that best fits the objective (see the text box on how one teacher thought about designing an assessment for an objective).

Assessment for lesson 1 objective 1: Students will write a journal entry in which they write about each part of a seed and describe what that part does for the growing plant. Students will also illustrate a seed and label the parts of a seed.

Sample of one teacher's thinking

For example, in the two lessons provided (see pp. 39-48) one of the objectives states "Through examining seeds students will be able to locate and identify each part of a seed: seed coat, embryo, endosperm and cotyledons." A teacher would think about several ways to assess such as:
1. students could be given a diagram with a word bank and asked to match the word to the part of the seed.
2. students could write sentences describing each part.
3. students could create a model of the parts of a seed and label the parts.
4. students could be asked to create a science journal entry where they illustrate the parts of a seed and then write about each part.

Assessment for lesson 1 objective 2: Students will write an individual prediction based on the question of the inquiry project. These will be posted on the Seed Prediction bulletin board.

References

List web or book resources that helped you develop part one.

Source(s) of Topic Strand Idea

Attach all sources used in developing part one printed and attached as an appendix

Rubric for Part One - Overview

	Yes	No
1. Introduction includes the grade level and interested in the science topic.	_____	_____
2. Next Generation Science Standards and/or Common Core Standards appropriate for the topic	_____	_____
3. Central focus clear and sufficiently comprehensive for a topic strand	_____	_____
4. Rationale/Context clearly written	_____	_____
5. Rationale/Context – lesson connections evident	_____	_____
6. Alignment Outline – illustrates Standard(s) connection to central focus & objectives	_____	_____
7. Objectives written appropriately	_____	_____
8. Assessment strategies appropriate for learning objective	_____	_____
9. Spelling, grammar, and syntax checked	_____	_____
10. Title page and electronic page numbering	_____	_____
11. Included citations for main resources that aided in developing Part 1	_____	_____
12. Attached print outs of all sources used in developing Part 1.	_____	_____

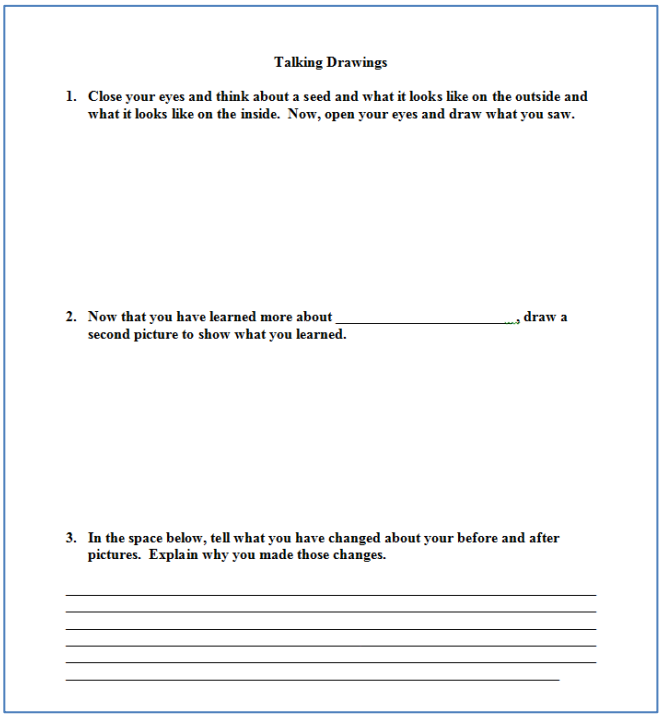
Part Two – One Complete Lesson Plan

Part two will allow you to create one complete lesson plan. This plan should be a direct teaching plan to introduce students to the "big idea"/topic. This is often called the preliminary plan. This should not be an experiment or one learning activity followed by another learning activity. See the sample of a preliminary plan on page 27 of this packet. This lesson sets the stage for the next two lessons that build from it.

Part two will include:

A. The first lesson of the strand
B. All handouts/support materials used in the lesson (textbook pages, worksheets, power point slides).

> For example, in lesson one, on seeds, it indicates that students took a pretest on something called a "talking drawing" and received directions for developing an inquiry. These two items would be the handouts/support materials that would be created and turned in with this lesson.



Talking Drawings

1. **Close your eyes and think about a seed and what it looks like on the outside and what it looks like on the inside. Now, open your eyes and draw what you saw.**

2. **Now that you have learned more about _____, draw a second picture to show what you learned.**

3. **In the space below, tell what you have changed about your before and after pictures. Explain why you made those changes.**

_____
_____
_____
_____
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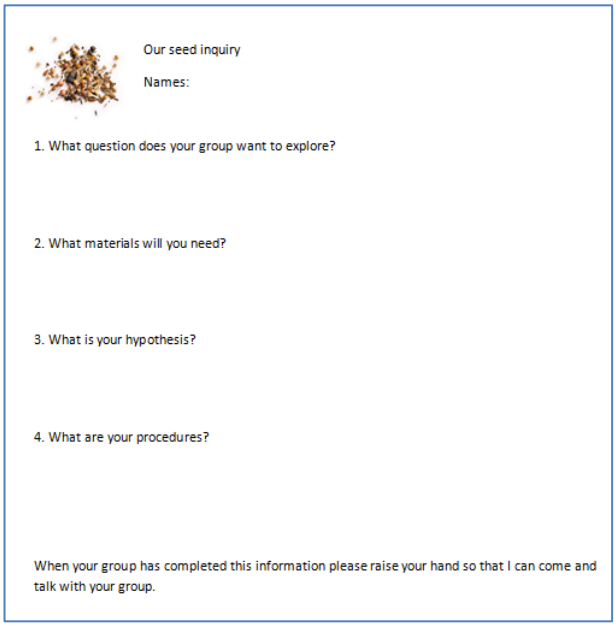


Our seed inquiry

Names:

1. What question does your group want to explore?

2. What materials will you need?

3. What is your hypothesis?

4. What are your procedures?

When your group has completed this information please raise your hand so that I can come and talk with your group.

C. Print out of all sources (e.g., source of the lesson idea, web sites, PDFs, textbook pages, nonfiction text) that were used to develop the lesson plan.

What you turn in for Part Two

I. Information that includes the grade level for which you are developing the lesson.

II. Full lesson plan for the first lesson of the strand – use the template on Black Board – refer back to your notes on the areas of the plan you do not need to address.
III. Handouts/support materials
IV. Print outs of all sources that were used to develop the lesson plan.

Rubric for Part Two

	Proficient 3	Basic 2	Unsatisfactory 1
Lesson Plan			
Connects to appropriate Next Generation Science Standards and/or relevant Common Core Standards IL-ISBE-IPTS-2012.3A			
Central focus and rationale clear, detailed, and relates to the overall strand. IL-ISBE-IPTS-2012.1H			
Effectively addressed academic language demands (vocabulary and function). IL-ISBE-IPTS-2012.2Q			
Assessment evident and appropriate for this lesson. IL-ISBE-IPTS-2012.2M IL-ISBE-IPTS-2012.2P IL-ISBE-IPTS-2012.7B IL-ISBE-IPTS-2012.7E IL-ISBE-IPTS-2012.7K			
Evidence of student learning is addressed clearly and in depth. IL-ISBE-IPTS-2012.7B IL-ISBE-IPTS-2012.7E IL-ISBE-IPTS-2012.7K			
Objectives - identifies knowledge and skills to be learned			
Objective - related to topic central focus			
Introduction meaningfully engages students and connects to prior knowledge. Clearly stated. IL-ISBE-IPTS-2012.1I IL-ISBE-IPTS-2012.5F			
Organized chronological instructional sequence detailed and clearly stated. IL-ISBE-IPTS-2012.4E IL-ISBE-IPTS-2012.4M IL-ISBE-			

	Proficient 3	Basic 2	Unsatisfactory 1
IPTS-2012.4P			
Structure of lessons provides students with enough contact with skills, concepts and/or content			
Key questions with anticipated/expected responses stated within the sequence of the lesson.			
Academic language demands used by teacher and students.			
Academic and social debriefing is meaningfully connected to the objectives.			
Handouts/support materials clearly fit the purpose of the lesson.			
Resources listed. APA citation style used.			
Handouts/Support Materials			
Materials – clearly identified and included and APA citation provided on support materials			
Overall Presentation			
The plan professionally presented attention paid to proof reading for mechanics, grammar, spelling, and syntax. IL-ISBE-IPTS-2012.6E			
Title page, electronic page numbering			
Appendix containing print outs of all sources used to develop the lesson plan			

Sample Plan

Topic Strand Lesson Plan Structure

We will use a slightly modified departmental plan template. If you use the template available on Task Stream, please note the areas you do not need to address in the Topic Strand lessons.

Highlighted areas in green do not need to be addressed in the topic strand lesson plans

Daily Lesson Plan Template

Name: Brooke (with permission) **Date of Lesson: 10/24/2016**

Grade: Sixth Number of Students: 25

Lesson Start Time: 2:00 How many minutes is the lesson? forty

Course/Subject: Science

Unit/Theme: Our Environment

Title of Lesson: What are Biomes?

Structure(s)/Grouping for the Lesson (check any that apply): **X** Whole Class ☐ Small Group ☐ One-to-One

Relevant Characteristics of Students that Need to be Considered when Developing Plan (non-IEP/504 plan students):
There is one student with an IEP.

List the Needs of Students with IEPs and or with 504 plans:

The IEP student needs to work in the back of the room to minimize distractions. This student is already in a place with few distractions and with students this student can work with.

NOTE:
Attach all documents related to this lesson, e.g., rubrics, handouts, criteria checklists, worksheets, graphic organizers, Power Point, handouts, tests, quizzes, answer keys, etc. or any additional documentation related to your instruction and assessment strategies.

I. OVERVIEW OF ESSENTIAL LESSON ELEMENTS

Lesson Focus:
What is the purpose of this lesson?
How does/should this lesson build from the one before it and set up the lesson that follows it?

Lesson Focus:
Students will be introduced to the major biomes. This will include learning primarily about the climate with information provided about animals and plants that comprise each biome.

Standards:
List the Standards (learning and social/emotional) that are **most relevant to your objective(s)**:

For Science, List the Next Generation Science Standards
For Math and Literacy, List the Common Core Standards
For Other Subject Areas, List the IL Learning Standards
For any applicable lessons in any content area, also list ELA CCSS and/or Social Emotional Learning Standards

Standards:
Next Generation Science Standards:
3-LS4 Biological Evolution: Unity and Diversity
3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Academic Language Demands:
Language demands are specific ways that academic language (vocabulary, functions, discourse, syntax) is used by students to participate in learning tasks through reading, writing, listening, and/or speaking to demonstrate their disciplinary/content understanding.

Identify Particular Words/Phrases that are Essential to Understanding the Content of this Lesson.

Syntax or **Discourse** (1 required – select the one most relevant to this lesson)**:**
Syntax
- The rules for organizing words or symbols together into phrases, clauses, sentences or visual representations

OR Discourse
- How people talk, write, and participate in knowledge construction using written and oral language

Functions (no more than the number of objectives)**:**
1. Purpose for which language is used
2. Content and language focus of the learning task – often represented by the active verbs used in your objectives

Vocabulary:
1. Words and phrases with subject-specific meanings that differ from meanings used in everyday life

2. General academic vocabulary used across disciplines
3. Subject-specific words and/or symbols defined for use in the content area

How will you provide language support to students? (see *Understanding Academic Language in edTPA: Supporting Learning and Language Development* PDF)

How do students use language to accomplish learning objective(s)?

Academic Language Demands:

Syntax or Discourse: Students will use complete sentences when they respond.

Function (Usually verb from learning objective): identify, describe

Vocabulary (related to the content of the lesson and function): flora, fauna, tundra, taiga, tropical rain forest, temperate deciduous forest, grassland, desert, chaparral, biome, precipitation, bitter, precipitation, humidity, mild, environment, equator

Objective 1 and 2:

- Four components present: Content, Behavior, Condition and Criterion
- Observable, measurable
- Activities are not objectives

For example:

1. After reading and discussing two informational texts, students will be able to write a mock newscast containing three common aspects and two differing aspects in the plans and projects carried out to save endangered animals in the United States and the United Kingdom.
2. Given a list of ten elements, students will be able to identify those elements that are metals with 75% accuracy.
3. Students will create a time line of the main events at Gettysburg, after generating a graphic organizer based on Chapter 5: A decisive battle, with a rubric rating of 3 (out of 5) or better.

In the introduction under "Lesson Sequence" you will convert your objectives into student friendly learning targets.

Write your objective as a learning target statement

For example: I can describe the similarities and differences of how endangered animals are protected in the United States and United Kingdom. I can discuss the impact of these efforts to save endangered animals used by the United States and the United Kingdom.

Name the tool(s)/technique(s) used to assess the objective

- Tool or technique used

(For example: Venn Diagram, guided notes sheet, draft of poster ideas, draft of essay, answers and solution for mathematics problems, lab write up, performance of a speech, vocal part of a musical score, instrumental part of a musical score, or physical education skill)

Objective 1 and 2: Evidence of Student Learning:
What will you see, hear, or read from students that show they are making progress or not making progress?

Objective 1: Given a map of North America, students will be able to identify where at least 5 of the 7 major biomes are located.

Name the tool(s)/technique(s) used to assess the objective:
Use of a blank map will have the students identify where each biome is located on a map of North America by coloring in and numbering the biome area.

Objective 1: Evidence of Student Learning:
I will examine the responses on the map to determine whether the correct biome locations are labeled on the map.

NOTE: Make sure the use of the assessment tool by students is clearly evident in the lesson sequence.

Objective 2: Given descriptions of each biome, students will be able to describe the climate of at least 5 of the 7 identified biomes.

Name the tool(s)/technique(s) used to assess the objective:
I will use a worksheet where students match the climate to the biome.

Objective 2: Evidence of Student Learning:
I will examine the responses on the worksheet for correct match of climate to biome.

NOTE: Make sure the use of the assessment tool by students is clearly evident in the lesson sequence.

II. LESSON SEQUENCE

For each section of the lesson sequence below, provide a detailed, step-by-step listing of how you will implement the instructional plan.

- Describe what you will do in each segment of the lesson sequence.
- Describe what your students will do in each segment of the lesson sequence.

- Ensure that students are engaged (i.e., students are meaningfully active and show interest throughout the lesson).
- Ensure that the segments in the lesson sequence build toward students' achievement of your objectives.
- Ensure that scaffolding and assessment of objectives are visible in the lesson sequence.
- In the left column provide approximate time for each segment.

Introduction:

Identify how you are going to introduce the concept, skill, strategy, or task in a way that links to the content of previous lessons, gains the students' attention and engages them. Make sure you state the learning target and state what behavior you are expecting from students during the lesson.

Number of minutes	**Introduction:**
8 Minutes	Introduction: • Pose question – What is a biome? (Take a few student responses). • Watch Biome from Brain Pop to find the answer. https://www.brainpop.com/science/earthsystem/landbiomes/ • After Brain Pop - What is a biome? (an environment) • What are some of the major biomes? (Tundra, Taiga, Tropical Rain Forest, Temperate Deciduous Forest, Grassland, Desert, Chaparral) As each answer is given show a picture of that biome. • Tell students that sometimes the same animals and plants can live in more than one biome (for example ants, birds, arachnids). • Explain to the students that the biomes often have different types of animals and plants, or fauna and flora, which have adapted to the environment. • Could a polar bear live in a desert? Why or why not? (No because it needs lots of water and the cold to survive) • What animal do you think could live in a desert? Why? (Snake because it can endure extreme heat. Or other varied answers.) (InstructorWeb, 2005)

Instructional Sequence:

Within the sequence include:

- instructional strategies (for example, I do, We do, You do in small groups, You do on your own)
- how students are engaged
- academic language demands
- questions and anticipated responses
- differentiation
- checks for understanding

Include **bold headings** for each learning segment, for example, direct teaching, guided practice, small group work, independent practice. Include the number of minutes for each segment. Make sure your content understanding is evident in each segment. For example, your questions and anticipated responses are written, detailed notes are included in the lesson sequence of the content from PowerPoint/smartboard pages, an answer key accompanies a copy of a worksheet or quiz, questions and correct answers for clicker questions are provided.	
Number of minutes 25 minutes	**Instructional Sequence:** Our learning target for today will be to find out where 7 specific biomes are located in North America and what kind of climates are in each biome. 1. Tell the students they will first be exploring where the biomes are located in North America. Though the biomes are located throughout the entire world, the 7 we will be talking about can all be found in North America. 2. Hand out the black and white blank maps. 3. Tell the students to take out their coloring supplies, but not to use any of them until directed. Let them know they will be coloring in certain areas for certain biomes. 4. Pull up the colored in map on the Smart Board. 5. Go through each biome and have the students color in the regions of the map that contain those biomes. As each biome is discussed display the corresponding biome poster. 6. The tundra is the coldest biome. Knowing that the tundra is the coldest biome, where do you think the tundra would be located? (Near the Arctic at the top of the world) Have the students color in the tundra area purple. 7. Taiga, also known as the coniferous forest, has long winters and short summers. Taiga is one of the largest (Green) Have the students color in the Taiga with lime green. 8. Next is the Tropical Rain Forest. The Tropical Rain Forest is typically warm all year. Where do you think the rainforest is located? (Near the equator) Which color do you think it is? (Red) Have the students color in the Rainforest with Red. 9. Now is the Temperate Deciduous Forest. This biome usually includes all four seasons: winter, spring, summer, and fall. Knowing that all 4 seasons occur, where do you think the Temperate Deciduous Forest would be located? (Middle of the North America) Have the students color in Dark Green. 10. Next, we are looking for the Grasslands. The Grassland biome is usually warmer and fairly dry. What color do you think the Grasslands are? (Yellow) Why? (Varied answers) Have the students

	color in yellow. 11. Our sixth biome is the Desert. The desert is typically hot and dry and houses such plants as cacti. Where do you think Deserts would be located? (More southern) So what color are the deserts on this map? (Pink) Have students color in pink. 12. Our final biome is the Chaparral. This biome is usually found in smaller sections. Due to the heat and dry climate droughts and fires are common in the Chaparral. What color do you think is the Chaparral? (Maroon) Why? (Varied answers) Have students color in Maroon. Small Group: Work collaboratively in small groups. 1. Next tell the students that they will be working in groups to determine what the climates would be like in each region. Each group will get an I-Pad they will use to research the climate. Using the maps they colored in and the research they find they will fill in the chart provided. 2. Question: What kind of research will we be looking for if I say, "we are researching the biomes' climates"? (Weather, Temperature, Rain Fall, Etc.) 3. Show the students on the Smart Board the website you wish them to use for their research. Identify the areas within the website that could be useful. (http://kids.nceas.ucsb.edu/biomes/index.html) 4. Hand out the I-Pads and graphic organizers (biome climate chart), and let the student research biomes on I-Pads 5. Have students with extra needs work with the teacher during Fill in the Chart with climate descriptions. This is small group time. 6. Within the small group, guide the students when needed, but give them a chance to research on their own first. Direct the students to the identified website. a. Questions when circulating to small groups b. Question: Which biome would we like to explore first? (Varied Answer questions. c. Question: What headings should we look under to find out about climate? (Location and Weather) d. Question: After reading the paragraphs are there a couple key descriptions you think we should write down? (Yes) What are the important descriptors? (Varied answers) 7. Be there to answer any questions students may stumble upon during reading, such as various vocabulary word definitions. Whole Group: Share responses. 1. Have the students share their findings. Record descriptions on the board so the students can add any information they hadn't found in

	their own groups.
Academic and social debriefing At the end of this lesson ask students questions that allow them to demonstrate their understanding of the new content (include expected responses). Ask them to identify what worked well when they collaborated together. State how what they learned connects to the next day's lesson.	
Number of minutes 4 minutes	**Academic and social debriefing:** Closure: 1. What was our learning target for the day? (To locate the biomes on a map and find out their climates) 2. Why is it important to know about biomes? (In order to survive in this world each animal and plant must be able adapt to its surrounding environment. In order to identify why animals and plants exist in certain areas of the world and how they survive in those various places you need to know about the key characteristics of those environments.) 3. What did your small group do that helped everyone learn about biomes? Pass out worksheet (biome map and climate-biome match) for independent practice

III. ADDITIONAL CONSIDERATIONS

Differentiation/Extension: What did you do in your plan to differentiate or extend for students with • IEPs, • 504 Plans, • Gifted, and • All Other Students with Specific Learning Needs:
Differentiation/Extension: WE WILL NOT BE ADDRESSING THIS IN EACH LESSON PLAN.

What Ifs: Be proactive
• Consider what might not go as planned with the lesson
  ○ Student misconceptions
  ○ Non-response
  ○ Confusion

- Lesson too short or too long
- Students need additional challenge
- Material/equipment failure, etc.

- What will you do about it?

What Ifs:

WE WILL NOT BE ADDRESSING THIS IN EACH LESSON PLAN.

Resources and Materials:

- In addition to attaching the materials and resources used in teaching this lesson, list/cite the resources and materials used in your planning and research for the lesson.
- If the materials are district/school required, please note that next to the resource or material.
- Teacher candidates need to appropriately cite credible sources used to develop their own content and substantiate the content taught, as well as sources used to develop the lesson plan.

Source Lesson Idea:

Conversations with my cooperating teacher.

InstructorWeb. (2005). Biomes lesson plan, teaching science elementary activity. Retrieved from http://www.instructorweb.com/lesson/biomeidentify.asp

Resources and Materials:

BrainPop. (2015). *Learn about land biomes* [Video view]. Retrieved from https://www.brainpop.com/science/earthsystem/landbiomes/

Kids Do Ecology. (2004). KDE Santa Barbara. Retrieved from http://kids.nceas.ucsb.edu/biomes/

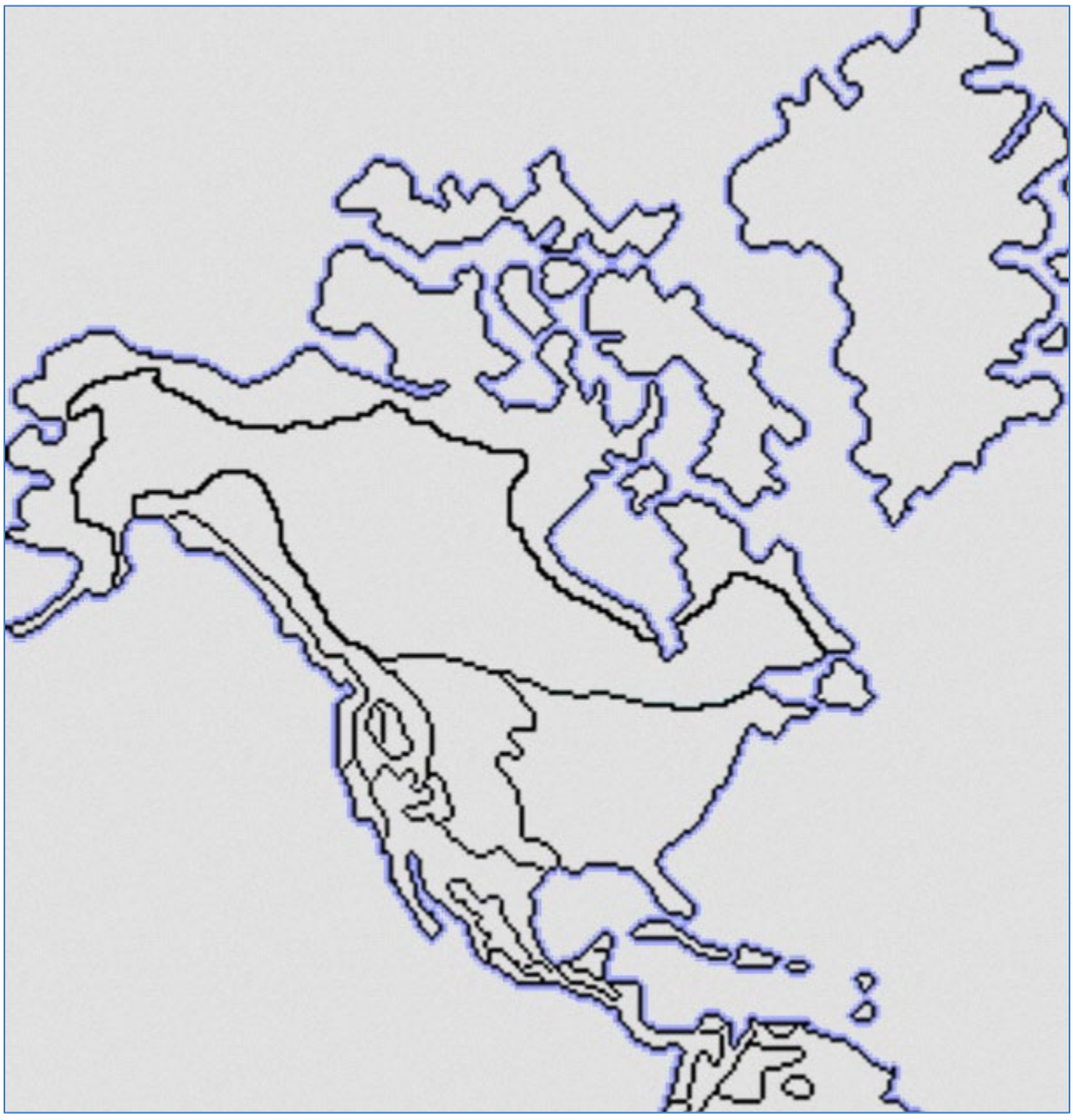
MBGNet. (2015). *Blame world mop* [Map]. Retrieved from http://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdco2/tdcO2_img_biomemap/tdco2_img_biomemap.gif

PBS. (2015). Biomes. Retrieved from http://www.pbslearningmedia.org/resource/tdc02.sci.life.eco.lp_biomes/biomes/

Made by me: Climate charts, Map Worksheets

Other materials: Smart Board, Power Point, Biome World Map worksheet, Coloring supplies, I-Pads, Climate Worksheets, Biome Posters

ATTACHMENTS – These included copies of the climate chart and worksheets



Name: _____ Date _____

Biome Climate Chart

Use your iPad to find information about the climate in each of the biomes. Be sure to mention high and low temperatures, types of seasons, and the amount of rainfall for one year.

Biome	Climate
Chaparral	
Desert	
Grassland/Savanna	
Taiga	
Temperate Deciduous Forest	
Tropical Rain Forest	
Tundra	

Name: _____ Date _____

Possible Answers for the Biome Climate Chart

Use your iPad to find information about the climate in each of the biomes. Be sure to mention high and low temperatures, types of seasons, and the amount of rainfall for one year.

Biome	Climate
Chaparral	Very hot and dry; mild winters; temperatures range between 30°F-100°F; the average rainfall is 10-17 inches a year (mostly in the winter); this biome is only found in parts of Oregon and parts of California; there are four seasons
Desert	Extremely dry and hot; very hot during summer and mildly warm the rest of the year; 5-10 inches for rain a year; temperature can range between 68°F – 120°F
Grassland/Savanna	Usually warm with temperatures ranging from 68°F to 86°F; the summer season is wet and last between 6-8 months; the annual rainfall is 30-40 inches a year; fires can start easily
Taiga	Long, cold winters; short, mild, wet summers; arctic winds make winter bitterly cold; winter days are short (hours of daylight); temperature usually ranges from -54°F - 70°F; mainly two seasons winter and summer; summer days are long (20 hours of daylight); fires are not uncommon; lots of rain and snow (12-33 inches)
Temperate Deciduous Forest	Four changing seasons (winter, spring, summer, fall); wet environment; receive 30-60 inches of rain a year; temperature ranges between below freezing to 70°F
Tropical Rain Forest	Hot and wet all year; temperature ranges from 68°F-93°F; it rains 50-260 inches of rain a year; high humidity (77-88%)
Tundra	Coldest and driest of all of all biomes; little rainfall (6-10 inches a year); winters are long; summers are short (6-10 weeks); temperature usually ranges from -50°F - 50°F; permafrost in the summer; two seasons (summer & winter)

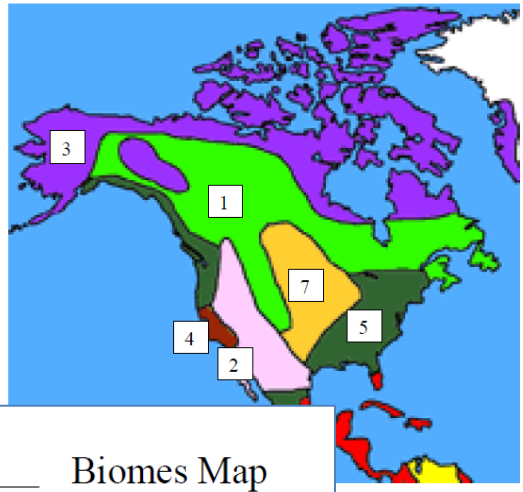
Independent Practice

Name _____

Biomes Map

Match the correct biome name to its number (location) on the map.

- ☐ tropical rainforest
- ☐ chaparral
- ☐ tundra
- ☐ grasslands
- ☐ temperate deciduous forest
- ☐ desert
- ☐ taiga

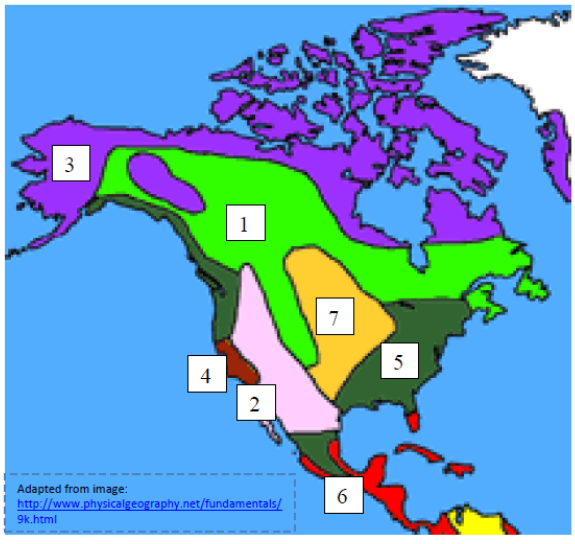


Name ___ANSWER KEY_____

Biomes Map

Match the correct biome name to its number (location) on the map.

- 6 tropical rainforest
- 4 chaparral
- 3 tundra
- 7 grasslands
- 5 temperate deciduous forest
- 2 desert
- 1 taiga



Adapted from image: http://www.physicalgeography.net/fundamentals/9k.html

Turn over for climate matching.

Match the biome to its climate

Write the number of the correct climate description by the name of the biome

_____Tundra	1. Long, cold winters; short, mild, west summers; artic winds make winter bitterly cold
_____Chaparral	2. Four changing seasons; summers are mild; winters below freezing
_____Grassland	3. Lush and warm al year; extremely wet and rainy; high humidity
_____Taiga	4. Very hot and dry; mild winters; most rain comes in winter; so dry in summer that droughts are common
_____Desert	5. There are 6-8 months of wet summer and 4-6 months of dry winter; when dry lightning may strike and start fires.
_____Tropical Rainforest	6. Coldest and driest of all biomes; little rainfall; winters
_____Temperate D Forest	

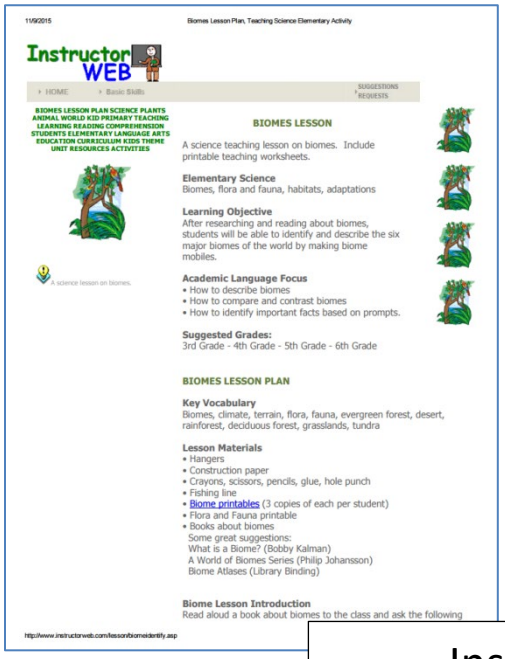
Match the biome to its climate – Answer Key

Write the number of the correct climate description by the name of the biome

6_____Tundra	1. Long, cold winters; short, mild, west summers; artic winds make winter bitterly cold
4_____Chaparral	2. Four changing seasons; summers are mild; winters below freezing
5_____Grassland	3. Lush and warm al year; extremely wet and rainy; high humidity
1_____Taiga	4. Very hot and dry; mild winters; most rain comes in winter; so dry in summer that droughts are common
7_____Desert	5. There are 6-8 months of wet summer and 4-6 months of dry winter; when dry lightning may strike and start fires.
3_____Tropical Rainforest	6. Coldest and driest of all biomes; little rainfall; winters are long; summers are short; permafrost sets
2_____Temperate Deciduous Forest	7. Extremely dry and hot; very hot during summer and mildly warm the rest of the year; evaporation occurs faster than the rainfall rates

Appendix of resources used in developing the Part1 or Part 2 or the full topic strand

These would actually be printed as full-size pages in your assignments.



11/9/2015 Biomes Lesson Plan, Teaching Science Elementary Activity

Instructor WEB

HOME › Basic Skills SUGGESTIONS REQUESTS

BIOMES LESSON PLAN SCIENCE PLANTS ANIMAL WORLD KID PRIMARY TEACHING LEARNING READING COMPREHENSION STUDENTS ELEMENTARY LANGUAGE ARTS EDUCATION CURRICULUM KIDS THEME UNIT RESOURCES ACTIVITIES

A science lesson on biomes.

BIOMES LESSON

A science teaching lesson on biomes. Include printable teaching worksheets.

Elementary Science
Biomes, flora and fauna, habitats, adaptations

Learning Objective
After researching and reading about biomes, students will be able to identify and describe the six major biomes of the world by making biome mobiles.

Academic Language Focus
- How to describe biomes
- How to compare and contrast biomes
- How to identify important facts based on prompts.

Suggested Grades:
3rd Grade - 4th Grade - 5th Grade - 6th Grade

BIOMES LESSON PLAN

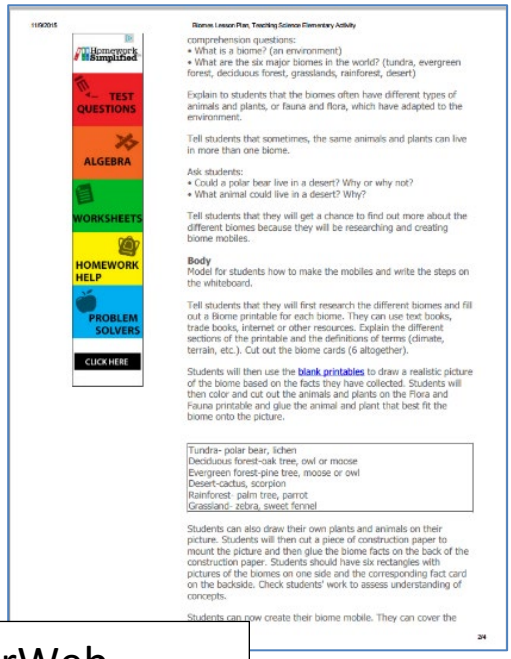
Key Vocabulary
Biomes, climate, terrain, flora, fauna, evergreen forest, desert, rainforest, deciduous forest, grasslands, tundra

Lesson Materials
- Hangers
- Construction paper
- Crayons, scissors, pencils, glue, hole punch
- Fishing line
- Biome printables (3 copies of each per student)
- Flora and Fauna printable
- Books about biomes

Some great suggestions:
What is a Biome? (Bobby Kalman)
A World of Biomes Series (Philip Johansson)
Biome Atlases (Library Binding)

Biome Lesson Introduction
Read aloud a book about biomes to the class and ask the following

http://www.instructorweb.com/lessonbiomeidentify.asp



11/9/2015 Biomes Lesson Plan, Teaching Science Elementary Activity

Homework Simplified

TEST QUESTIONS
ALGEBRA
WORKSHEETS
HOMEWORK HELP
PROBLEM SOLVERS
CLICK HERE

comprehension questions:
- What is a biome? (an environment)
- What are the six major biomes in the world? (tundra, evergreen forest, deciduous forest, grasslands, rainforest, desert)

Explain to students that the biomes often have different types of animals and plants, or fauna and flora, which have adapted to the environment.

Tell students that sometimes, the same animals and plants can live in more than one biome.

Ask students:
- Could a polar bear live in a desert? Why or why not?
- What animal could live in a desert? Why?

Tell students that they will get a chance to find out more about the different biomes because they will be researching and creating biome mobiles.

Body
Model for students how to make the mobiles and write the steps on the whiteboard.

Tell students that they will first research the different biomes and fill out a Biome printable for each biome. They can use text books, trade books, internet or other resources. Explain the different sections of the printable and the definitions of terms (climate, terrain, etc.). Cut out the biome cards (6 altogether).

Students will then use the blank printables to draw a realistic picture of the biome based on the facts they have collected. Students will then color and cut out the animals and plants on the Flora and Fauna printable and glue the animal and plant that best fit the biome onto the picture.

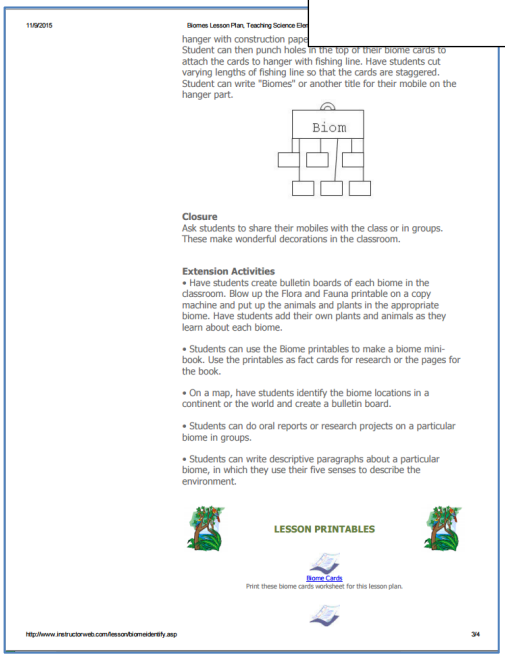
Tundra- polar bear, lichen
Deciduous forest-oak tree, owl or moose
Evergreen forest-pine tree, moose or owl
Desert-cactus, scorpion
Rainforest- palm tree, parrot
Grassland- zebra, sweet fennel

Students can also draw their own plants and animals on their picture. Students will then cut a piece of construction paper to mount the picture and then glue the biome facts on the back of the construction paper. Students should have six rectangles with pictures of the biomes on one side and the corresponding fact card on the backside. Check students' work to assess understanding of concepts.

Students can now create their biome mobile. They can cover the

3/4

InstructorWeb



11/9/2015 Biomes Lesson Plan, Teaching Science Ele

hanger with construction pape
Student can then punch holes in the top of their biome cards to attach the cards to hanger with fishing line. Have students cut varying lengths of fishing line so that the cards are staggered. Student can write "Biomes" or another title for their mobile on the hanger part.

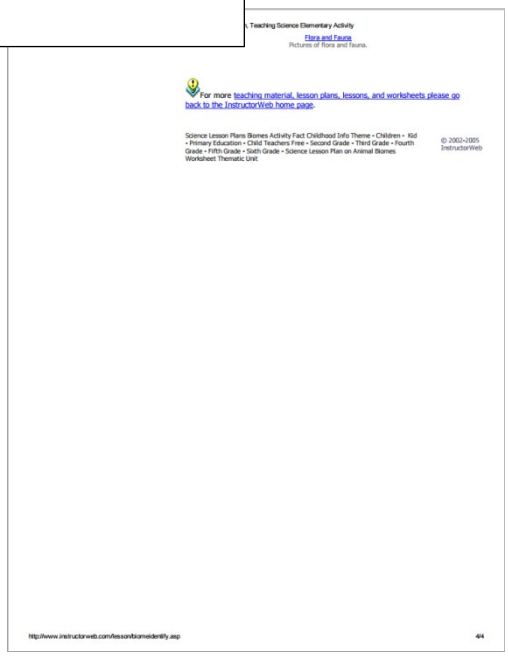
Closure
Ask students to share their mobiles with the class or in groups. These make wonderful decorations in the classroom.

Extension Activities
- Have students create bulletin boards of each biome in the classroom. Blow up the Flora and Fauna printable on a copy machine and put up the animals and plants in the appropriate biome. Have students add their own plants and animals as they learn about each biome.
- Students can use the Biome printables to make a biome mini-book. Use the printables as fact cards for research or the pages for the book.
- On a map, have students identify the biome locations in a continent or the world and create a bulletin board.
- Students can do oral reports or research projects on a particular biome in groups.
- Students can write descriptive paragraphs about a particular biome, in which they use their five senses to describe the environment.

LESSON PRINTABLES

Biome Cards
Print these biome cards worksheet for this lesson plan.

http://www.instructorweb.com/lessonbiomeidentify.asp 3/4



Teaching Science Elementary Activity

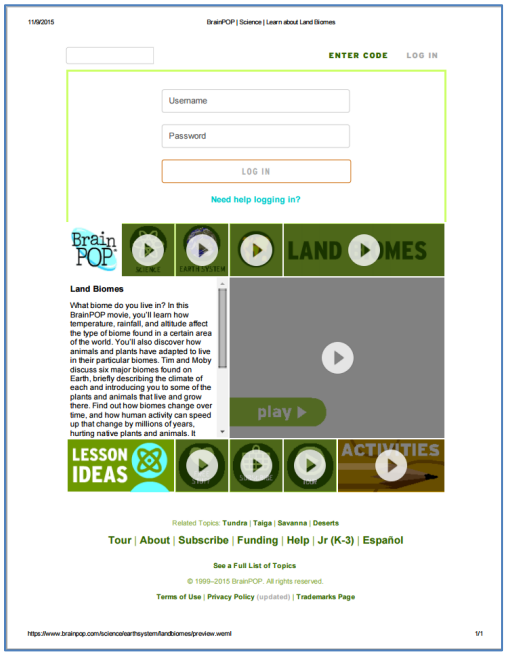
Flora and Fauna
Pictures of flora and fauna.

For more teaching material, lesson plans, lessons, and worksheets please go back to the InstructorWeb home page.

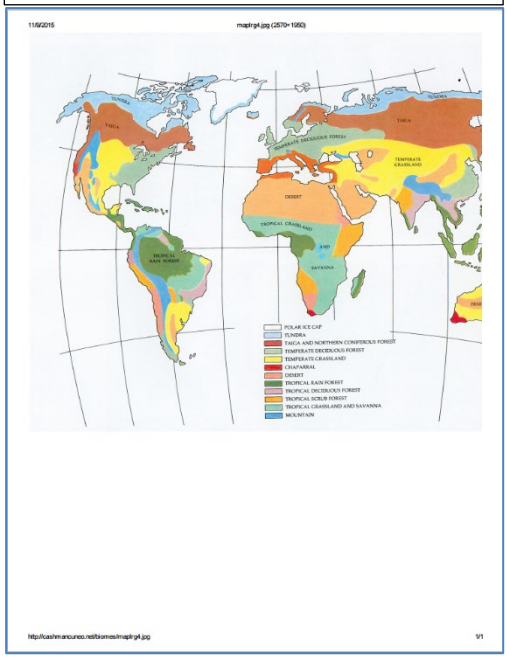
Science Lesson Plans Biomes Activity Fact Childhood Info Theme - Children - Kid - Primary Education - Child Teachers Free - Second Grade - Third Grade - Fourth Grade - Fifth Grade - Sixth Grade - Science Lesson Plan on Animal Biomes Worksheet Thematic Unit

http://www.instructorweb.com/lessonbiomeidentify.asp 4/4

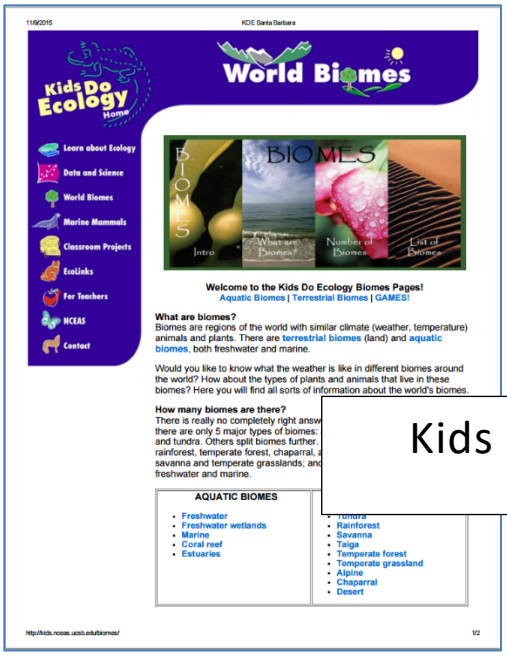
BrainPop

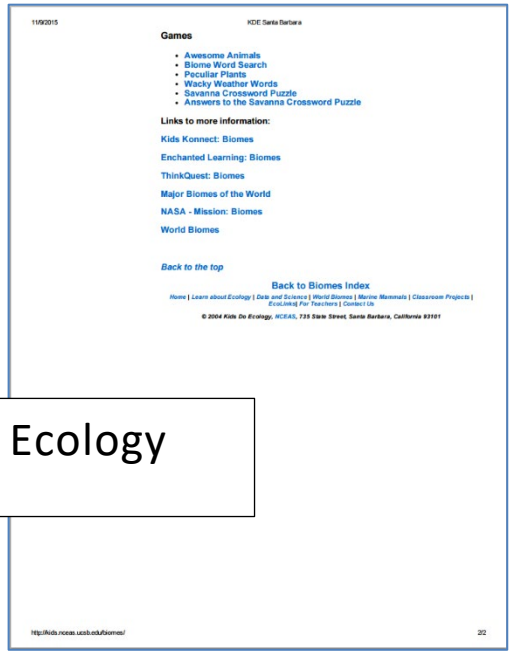


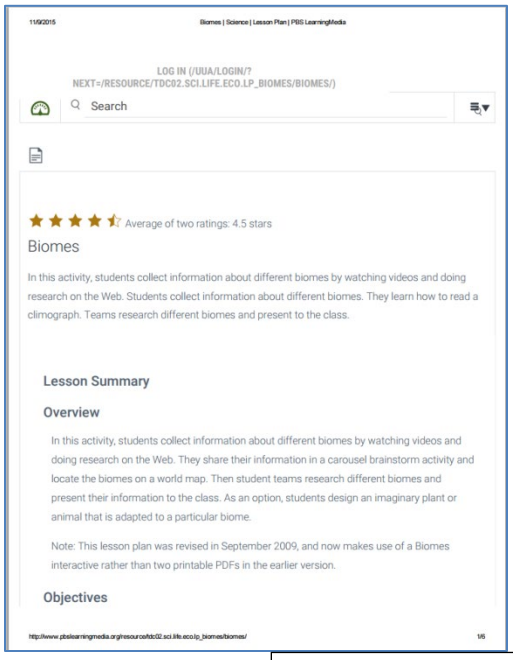
MBGNet



Kids Do Ecology







11/9/2015 Biomes | Science | Lesson Plan | PBS LearningMedia

LOG IN (/UUA/LOGIN/?NEXT=/RESOURCE/TDC02.SCI.LIFE.ECO.LP_BIOMES/BIOMES/)

Search

Average of two ratings: 4.5 stars

Biomes

In this activity, students collect information about different biomes by watching videos and doing research on the Web. Students collect information about different biomes. They learn how to read a climograph. Teams research different biomes and present to the class.

Lesson Summary

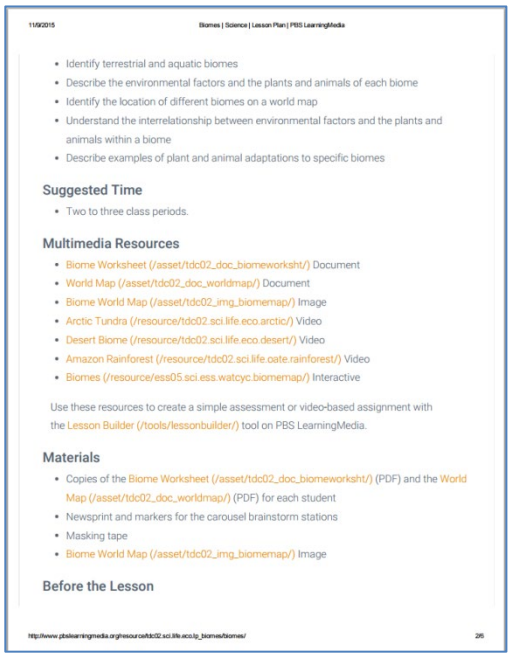
Overview

In this activity, students collect information about different biomes by watching videos and doing research on the Web. They share their information in a carousel brainstorm activity and locate the biomes on a world map. Then student teams research different biomes and present their information to the class. As an option, students design an imaginary plant or animal that is adapted to a particular biome.

Note: This lesson plan was revised in September 2009, and now makes use of a Biomes interactive rather than two printable PDFs in the earlier version.

Objectives

http://www.pbslearningmedia.org/resource/tdc02.sci.life.eco.lp_biomes/biomes/ 1/6



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- Identify terrestrial and aquatic biomes
- Describe the environmental factors and the plants and animals of each biome
- Identify the location of different biomes on a world map
- Understand the interrelationship between environmental factors and the plants and animals within a biome
- Describe examples of plant and animal adaptations to specific biomes

Suggested Time

- Two to three class periods.

Multimedia Resources

- Biome Worksheet (/asset/tdc02_doc_biomeworksht/) Document
- World Map (/asset/tdc02_doc_worldmap/) Document
- Biome World Map (/asset/tdc02_img_biomemap/) Image
- Arctic Tundra (/resource/tdc02.sci.life.eco.arctic/) Video
- Desert Biome (/resource/tdc02.sci.life.eco.desert/) Video
- Amazon Rainforest (/resource/tdc02.sci.life.oate.rainforest/) Video
- Biomes (/resource/ess05.sci.ess.watcyc.biomemap/) Interactive

Use these resources to create a simple assessment or video-based assignment with the Lesson Builder (/tools/lessonbuilder/) tool on PBS LearningMedia.

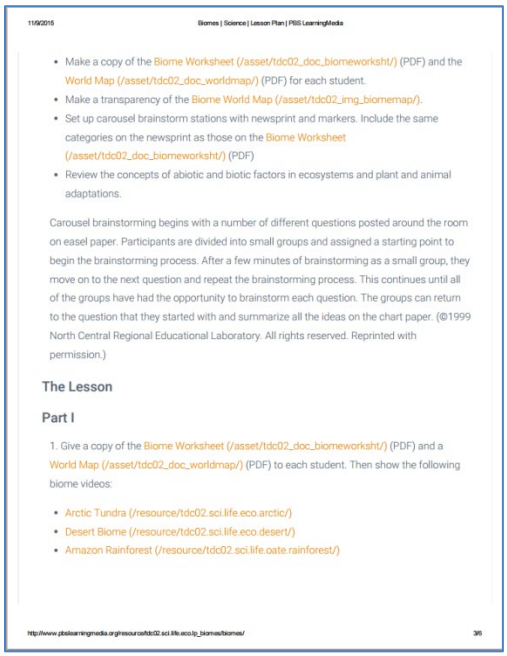
Materials

- Copies of the Biome Worksheet (/asset/tdc02_doc_biomeworksht/) (PDF) and the World Map (/asset/tdc02_doc_worldmap/) (PDF) for each student
- Newsprint and markers for the carousel brainstorm stations
- Masking tape
- Biome World Map (/asset/tdc02_img_biomemap/) Image

Before the Lesson

http://www.pbslearningmedia.org/resource/tdc02.sci.life.eco.lp_biomes/biomes/ 2/6

PBS



11/9/2015 Biomes | Science | Lesson Plan | PBS LearningMedia

- Make a copy of the Biome Worksheet (/asset/tdc02_doc_biomeworksht/) (PDF) and the World Map (/asset/tdc02_doc_worldmap/) (PDF) for each student.
- Make a transparency of the Biome World Map (/asset/tdc02_img_biomemap/).
- Set up carousel brainstorm stations with newsprint and markers. Include the same categories on the newsprint as those on the Biome Worksheet (/asset/tdc02_doc_biomeworksht/) (PDF)
- Review the concepts of abiotic and biotic factors in ecosystems and plant and animal adaptations.

Carousel brainstorming begins with a number of different questions posted around the room on easel paper. Participants are divided into small groups and assigned a starting point to begin the brainstorming process. After a few minutes of brainstorming as a small group, they move on to the next question and repeat the brainstorming process. This continues until all of the groups have had the opportunity to brainstorm each question. The groups can return to the question that they started with and summarize all the ideas on the chart paper. (©1999 North Central Regional Educational Laboratory. All rights reserved. Reprinted with permission.)

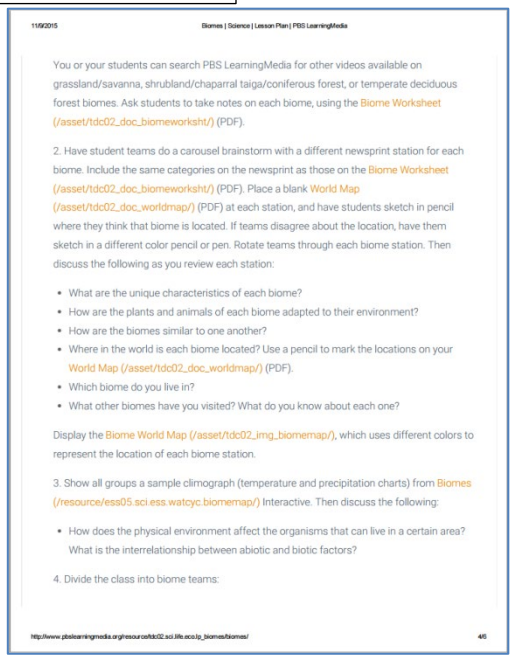
The Lesson

Part I

1. Give a copy of the Biome Worksheet (/asset/tdc02_doc_biomeworksht/) (PDF) and a World Map (/asset/tdc02_doc_worldmap/) (PDF) to each student. Then show the following biome videos:

- Arctic Tundra (/resource/tdc02.sci.life.eco.arctic/)
- Desert Biome (/resource/tdc02.sci.life.eco.desert/)
- Amazon Rainforest (/resource/tdc02.sci.life.oate.rainforest/)

http://www.pbslearningmedia.org/resource/tdc02.sci.life.eco.lp_biomes/biomes/ 3/6



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You or your students can search PBS LearningMedia for other videos available on grassland/savanna, shrubland/chaparral taiga/coniferous forest, or temperate deciduous forest biomes. Ask students to take notes on each biome, using the Biome Worksheet (/asset/tdc02_doc_biomeworksht/) (PDF).

2. Have student teams do a carousel brainstorm with a different newsprint station for each biome. Include the same categories on the newsprint as those on the Biome Worksheet (/asset/tdc02_doc_biomeworksht/) (PDF). Place a blank World Map (/asset/tdc02_doc_worldmap/) (PDF) at each station, and have students sketch in pencil where they think that biome is located. If teams disagree about the location, have them sketch in a different color pencil or pen. Rotate teams through each biome station. Then discuss the following as you review each station:

- What are the unique characteristics of each biome?
- How are the plants and animals of each biome adapted to their environment?
- How are the biomes similar to one another?
- Where in the world is each biome located? Use a pencil to mark the locations on your World Map (/asset/tdc02_doc_worldmap/) (PDF).
- Which biome do you live in?
- What other biomes have you visited? What do you know about each one?

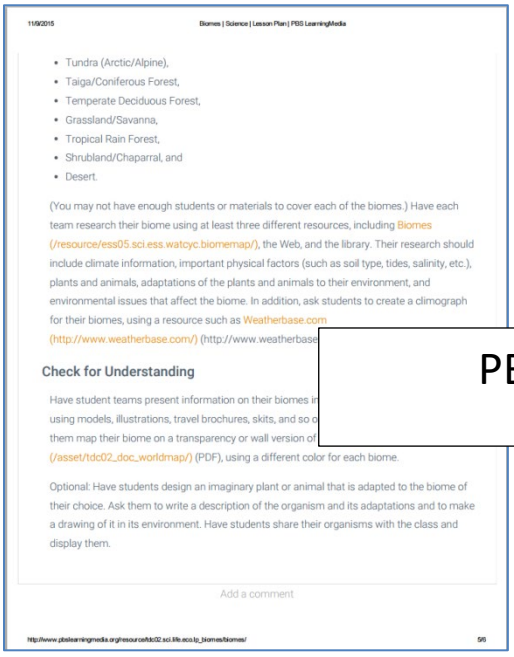
Display the Biome World Map (/asset/tdc02_img_biomemap/), which uses different colors to represent the location of each biome station.

3. Show all groups a sample climograph (temperature and precipitation charts) from Biomes (/resource/ess05.sci.ess.watcyc.biomemap/) Interactive. Then discuss the following:

- How does the physical environment affect the organisms that can live in a certain area? What is the interrelationship between abiotic and biotic factors?

4. Divide the class into biome teams:

http://www.pbslearningmedia.org/resource/tdc02.sci.life.eco.lp_biomes/biomes/ 4/6



11/9/2015 Biomes | Science | Lesson Plan | PBS LearningMedia

- Tundra (Arctic/Alpine),
- Taiga/Coniferous Forest,
- Temperate Deciduous Forest,
- Grassland/Savanna,
- Tropical Rain Forest,
- Shrubland/Chaparral, and
- Desert.

(You may not have enough students or materials to cover each of the biomes.) Have each team research their biome using at least three different resources, including Biomes (/resource/ess05.sci.ess.watcyc.biomemap/), the Web, and the library. Their research should include climate information, important physical factors (such as soil type, tides, salinity, etc.), plants and animals, adaptations of the plants and animals to their environment, and environmental issues that affect the biome. In addition, ask students to create a climograph for their biomes, using a resource such as Weatherbase.com (http://www.weatherbase.com/) (http://www.weatherbase

Check for Understanding

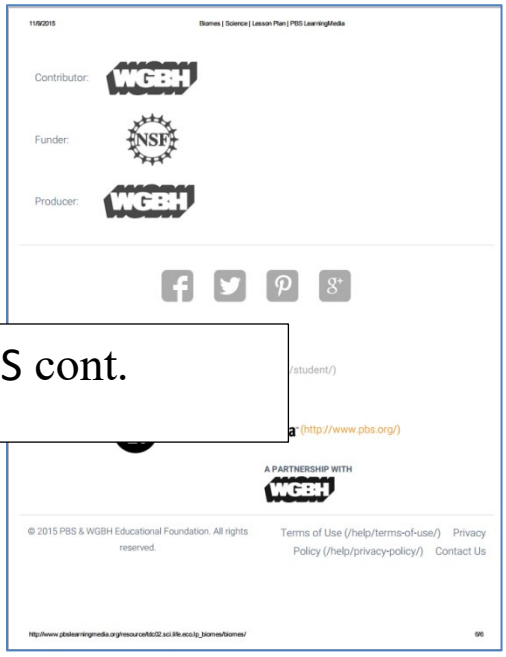
Have student teams present information on their biomes i
using models, illustrations, travel brochures, skits, and so o
them map their biome on a transparency or wall version of
(/asset/tdc02_doc_worldmap/) (PDF), using a different color for each biome.

Optional: Have students design an imaginary plant or animal that is adapted to the biome of their choice. Ask them to write a description of the organism and its adaptations and to make a drawing of it in its environment. Have students share their organisms with the class and display them.

Add a comment

http://www.pbslearningmedia.org/resource/tdc02.sci.life.eco.lp_biomes/biomes/ 5/6

PBS cont.



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Part Three – Full Topic Strand

As stated on the first page of the topic strand project,

A topic strand is a sequence of lessons related to one topic that is linked to the appropriate Next Generation Science Standard(s). A strand is part of a larger unit that your students will one day experience. Each lesson in the strand relates to your central focus and builds on each preceding lesson. In this way you are providing in depth experiences to your students and scaffolding their learning (Bransford, Brown, & Cocking, 2000).

You have already done work on parts of the strand by completing part one and part two. Now you need to complete the process for the other two lessons. The newest area is for you to consider how you will differentiate. Since it takes time to fully develop an understanding of differentiation, you will be asked to select just one of your three lessons and describe how you would differentiate. There are resources in Black Board on differentiation.

Overview of the topic strand

The following is an overview of the topic strand. It is provided so that you have some knowledge of all of its parts.

1. Standard(s) – State the K-12 Learning Standard that best aligns with the topic of your strand.

2. Central Focus – State the concept(s) being taught (this is more than the skills or facts to be learned.

3. Rationale for your topic- State why is it important for students to learn this topic in science? State why is this important to students' future learning? State how studying this topic will enhance and relate to students' lives either now or in the future?

4. Alignment Outline- Illustrate how your strand's standard, central focus, and lesson objectives are related. See a sample on page 3.

5. Lesson Plans - Your topic stand contains <u>three</u> lesson plans that fit a typical class period for the grade level you have selected.

   A. Handouts/support materials - Please include copies of the handouts and/or worksheets, tests, and formative assessments that you will give to your students or use as resources for yourself. Cite, using APA style, the sources of each handout not created by you. Also include a citation on the support materials not created by you (e.g., worksheets, assessments, PowerPoints).

6. Differentiation - Develop ideas about differentiating the lessons. Select <u>one</u> of your four lessons and state how you will differentiate for above grade level learners, at grade

level learners, and below grade level learners. This can be one type of differentiation such as process differentiation, product differentiation, or content differentiation.

7. Appendix – Print outs of all sources used in developing the Topic Strand.

O***rganization of the Topic Strand***

Your final product must be presented professionally: word processed, sources cited, pages electronically numbered, and in a three-ring binder. Do not put lessons into plastic sleeves.

Strand organizational structure

I. Cover page
II. Overview
    a. Strand Central Focus
    b. Rationale
    c. Standards
III. Alignment Outline
IV. Lesson 1
V. Lesson 2
VI. Lesson 3
VII. Differentiation – focus on one lesson
VIII. Appendix – Print outs of all sources used in developing the Topic Strand

Note: If using presentation application include your speaking notes/speaking points

Topic Strand Project Evaluation
Score /89

State and national standards					
ISBE standards 1,2, 3, 5	Standard(s) selected is appropriate for the strand, central focus, content area, and grade level NGSS, common core).		3	1/0	Standard(s) selected is not appropriate for the strand, for central focus, content area and grade level (NGSS, common core). Missing from introductory section.
Strand central focus					
	Central focus for the strand articulates the essential goal related to the content area and grade level. Rationale provides a thorough description of the reasons for the topic and how a lesson is connected to previous or succeeding lessons.	5	3	1/0	Central focus for the strand does not articulate the essential goal related to the content area and grade level. Rationale provides an incomplete description of the reasons for studying the topic and how lesson are connected to previous or succeeding lessons.
Inclusive evaluation of lessons in strand					
Alignment					
ISBE standards 1,2, 3, 5	Standard(s), lesson objectives, and assessments are clearly aligned and linked to specific performances and/or products within the strand.	5	3	1/0	Standard(s), lesson objectives, and assessment need development and/or not clearly aligned with each other.
Academic Language Demands					
	Sufficiently addressed academic vocabulary and language function.		3	1/0	Lacking in these ways:
Assessment					
ISBE standards 1,2, 3, 5	Assessment includes at least two different approaches. Assessment is clear and described in detail. Assessment items included.		3	1/0	The student assessment component is missing or not explicitly stated. Assessment items not included.
	Assessment aligned and appropriate to determine whether the objective has		3	1/0	Lacking in these ways:

	been met.				
	Evidence of student learning clearly articulated and appropriate for the lesson/objectives		3	1/0	Lacking in these ways:
Lessons and instructional strategies					
ISBE standards 1,2, 3, 5	At least two different instructional strategies are evident. At least one of these strategies involves indirect teaching, teacher as facilitator, high-level questioning, or teacher as mentor.		3	1/0	(a) Only the direct teaching instructional strategy is used or (b) missing elements from indirect teaching: teacher as facilitator, high-level questioning, or teacher as mentor.
ISBE standards 1,2, 3, 5	At least two different types of student learning activities are evident. Many involve active engagement or hands-on learning.		3	1/0	(a) No student learning activities are evident beyond question and response. (b) Little or no hands-on learning evident.
ISBE standards 1,2, 3, 5	Lessons build upon each other, clear and logical sequence		3	1/0	(a) Lessons unrelated, (b) inappropriate/confusing sequence of lessons
Collective examination of individual lessons					
Objectives					
ISBE standards 1,2, 3, 5	Identifies the process through which knowledge and skills are to be learned	5	3	1/0	Focused on a product of learning rather than the process of obtaining knowledge and skills, (b) objectives missing
ISBE standards 1,2, 3, 5	Objectives accomplished through the lessons		3	1/0	Objectives not accomplished through the lessons
Materials					
	Clearly identified in lesson and on handouts		3	1/0	Not clearly identified in lesson and/or on handouts
	Support materials included. APA citation provided for support materials in lesson and on		3	1/0	(a) Support materials not included. (b) APA citations not provided and/or not cited on support materials,

	support materials				(c) APA citations inaccurately written
Instructional sequence					
ISBE standards 3, 5	Clearly written steps	5	3	1/0	Unclear, steps missing
ISBE standards 3, 5	Solid content base	5	3	1/0	Weak content base
ISBE standards 3, 5	Structure of lessons provides enough contact with skills, concepts and/or content	5	3	1/0	Structure of lessons does not provide enough contact with skills, concepts, and/or content
	Lesson activities support conceptual development and higher order thinking for all students.		3	1/0	Only lower order thinking skills are emphasized.
	Questions and expected answers evident in the lessons. Questions develop students understanding.		3	1/0	(a) Questions and expected answers not evident in the lessons. (b) Questions do not develop students understanding, (c) missing questions.
	Academic vocabulary and language function used/modeled by teacher and students in the lesson		3	1/0	(a) Academic vocabulary and language function only used by the teacher. (b) Academic vocabulary and language function not used by the teacher and/or the students
ISBE standards 3, 5	Academic and social debriefing for lesson achieved		3	1/0	Academic and social debriefing for lesson not achieved
Differentiation					
ISBE standards 1,2, 3, 5	Stated thoroughly how one lesson could be differentiated using process, product, or content differentiation to allow for one of the following: pacing, depth, breadth, level of abstraction, level of complexity, degree of generalizability, or talent development.		3	1/0	No opportunities for differentiation are evident. Or Incomplete information on type of differentiation and/or application to three levels of students.

Professional format					
	Topic strand is presented professionally: (a) pages electronically numbered, (b) bound, (c) proof read used accurate spelling, grammar, syntax and punctuation	4	3	2/1/0	Unprofessional presentation
	Followed guidelines for strand development		3	2/1/0	Strand lacking in these ways:
	Appendix contains print outs of all sources used in developing the topic strand.	4	3	2/1/0	All sources not attached