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Grade Level: 7th and 8th

Suggested Time Allowance: 6 class periods of 45 minutes

Content Areas: Science, Social Studies

Description/Abstract: This unit uses an historic event, the Salem Witch Trials, to introduce students to the Fungus Kingdom

Curriculum Standards: Science and History& Social Studies

Concepts and Skills, Grades 8-2:

History and Geography:

5. Explain how a cause and effect relationship is different from a sequence or correlation of events. (H,C,E)
6. Distinguish between long-term and short-term cause and effect relationships. (H,G,C,E)
8. Interpret the past within its own historical context rather than in terms of present day norms and values. (H,E,C)

Science & Technology:

Guiding Principle II: An effective science and technology/engineering program builds students' understanding of the fundamental concepts of each domain of science and their understanding of the connections across these domains and to basic concepts in technology/engineering.

Learning Standards:

Life Science (Biology)

Classification of Organisms

1. Classify organisms into the currently recognized kingdoms according to characteristics that they share. Be familiar with organisms from each kingdom.

Guiding Question:

How could historic events such as the Salem witch trials have been affected by biology?

Introduction:

It may seem odd to be talking about the Salem witch trials of 1692 in a science class. From the modern day perspective there are some serious questions that scientists have raised about what happened in Salem and other historic events. Let's review what we know to have happened.

The trouble in Salem began during the Massachusetts winter, in January of 1692. Eight young girls began to take ill, beginning with 9-year-old Elizabeth Parris, the daughter of Reverend Samuel Parris, and his niece, 11-year-old Abigail Williams who lived with him. Their sickness presented very strange symptoms: delirium, violent convulsions, incomprehensible speech, trance-like states, and odd skin sensations. The Reverend and his neighbors were worried and desperately searched for the cause of this strange illness that had afflicted the girls. Their conclusion was that the girls were under a spell, bewitched. Worse yet, the cause of the spells were members of their own pious community.

Blame needed to be placed somewhere. The first to be accused three women; Tituba, Parris's Caribbean-born slave, along with Sarah Good, a homeless woman who begged from door to door, and Sarah Osburn, an elderly woman considered to be of ill repute. All three women were arrested on February 29. From there the hysteria spread until more than 150 people had been accused and arrested for being witches. Thirteen women and five men were hanged, one man was stoned to death, and four people died in jail, including one infant daughter of Sarah Good. None of these people ever confessed to witchcraft. A confession would have spared their lives, but condemned their souls.

On October 29, the governor of Massachusetts, Sir William Phips, halted the witch trials when his wife was accused of witchcraft. After things settled down and calm thought was allowed to take over, the townspeople and the accusers were at a loss to explain their own actions. Ann Putnam, a major accuser, had her apology read in church 14 years after the event. In the centuries that followed, scholars, historians, and scientists have tried finding an explanation for the madness that overwhelmed Salem. Was it a dietary deficiency, mass hysteria? Or, could a simple fungus have been the blame?

Resources:

Video:

Witches Curse

<http://www.pbs.org>

Witchcraft: The Salem Witch Trial

<http://www.historychannel.com>

Books:

Davidson, James West, The American Nation: Beginnings to 1877, Needham: Prentice Hall, 1997

Maton, Anthea, et al, Parade of Life: Monerans, Protists, Fungi, Plants and Animals, Needham, Prentice Hall, 1997

McKnight, Kent H, and Vera B, Peterson Field Guide: Mushrooms, Boston: Houghton Mifflin Company, 1987

Microslides:

_____, Microslide Lesson Set 241: The Five Kingdoms of Life, New Hyde Park: National Teaching Aids, inc., 1991

Internet:

American Society for Microbiology: Fungi

<http://www.microbe.org/microbes/fungi1.asp>

Dr. Fungus: Fungi, Fungus, Fugal

<http://www.doctorfungus.org/>

Ergot of Rye – I: Introduction and History

<http://www.botany.hawaii.edu/faculty/wong/BOT135/LECT12.HTM>

Explore Salem Interactive

http://www.pbs.org/wnet/secrets/case_salem/index.html

Fungi

<http://www.microbe.org/microbes/bungi.asp>

Fungus: Wikipedia – the free encyclopedia

<http://en.wikipedia.org/wiki/Fungi>

Intimate Strangers

<http://www.pbs.org/opb/intimatestrangers/index.html>

Introduction to the Fungi

<http://www.ucmp.berkeley.edu/fungi/fungi.html>

Ergotism: The Satan Loosed in Salem?

<http://web.utk.edu/~kstclair/221/ergotism.html>

Natural Perspective: Fungus Kingdom

<http://www.micro.msb.le.ac.uk/MBChB/6a.html>

Pathogenic Fungi

<http://www-micro.msb.le.ac.uk/MBChB/6a.html>

Learning Activities:

Day 1:

1. Students will view film clips and complete the accompanying worksheet.
2. Students will view the website SECRETS OF THE DEAD then participate in a class discussion of ergot fungus and how it could have contaminated the rye grain.

Day 2 & 3

3. The teacher will pair up students for the lab, research and presentation.
Students will complete the Lab: Kingdoms

Day 4

4. Each paired team will pick a specific fungus and complete research on that fungus

Day 5

5. Each paired team will pick a specific fungus and prepare a five minute oral presentation with visual references (such as a backboard presentation or power point presentation).

Day

5. Students will complete a test on the kingdom Fungi

Assessment:

1. Rubric for worksheets
2. Rubric for labs
3. Rubric for backboard display/power point presentation
4. Rubric or oral presentations

NAME _____

DATE _____

CLASS/GROUP _____

WITCHES CURSE VIDEO WORKSHEET

Directions: After viewing the video clips, answer the following questions using complete sentences.

1. What were the symptoms of "bewitchment"? _____

2. Why were there no scientific explanations for the affliction? _____

3. What were the pros and cons of confessing to be a witch? _____

4. What effects does LSD have on a person? _____

5. What is ergot? _____

6. How did Albert Hoffmann discover the effects of ergot's extracts? _____

7. How do you think the residents of Salem could have come in contact with ergot?

8. How was the event in France in 1951 similar to what happened in Salem? _____

9. In reference to question #8, what was different this time? _____

10. Do you think that the evidence presented by Linnda Caporael is proof that the illness that prompted the witch trials was caused by a fungus? Why/Why not? _____

Rubric for Worksheets

Category	4	3	2	1	Rating
Time and Effort	Class time was used wisely; worksheet was complete; answers were thorough.; work was done at home as well as at school	Class time was used wisely; worksheet was complete; some work was done at home as well as at school	Class time not always used wisely; some parts were incomplete; work was not done at home	Class time was not used wisely; many incomplete parts; no work was done at home	
Text Content/Research	Shows much research; facts are accurate and are accompanied with supporting data or examples	Shows research has been done; facts are accurate; some accompanying data or examples	Some research has been done; some inaccuracies; few examples or accompanying data	Little or no research done; many inaccuracies, no examples or accompanying data	
Grammar, Mechanics, Spelling	Complete sentences used to answer questions; few errors in punctuation, capitalization, or tense; no spelling errors	Complete sentences used to answer questions; few errors in punctuation, capitalization, or tense; some spelling errors	Sentence fragments are frequently used to answer questions; errors in punctuation, capitalization, and tense occur frequently; many spelling errors	Complete sentences are not used; many spelling errors	
Finished Product	All areas of the worksheet are complete, accurate & thorough.	Most areas of the worksheet are complete, accurate & thorough	Several areas of the worksheet are incomplete, inaccurate, or blank	Worksheet is mostly blank, inaccurate, or not done at all.	

Teacher's Comments:

DIRECTIONS FOR BACKBOARD DISPLAY

1. Learning groups will create a free standing backboard display of their research topic. (Standard backboard size used for science fairs)
2. Each backboard display will have clear titles & topic headings.
3. Backboard displays will show clear evidence of solid research skills
4. Sources are clearly cited on the display (minimum of 4)
5. Computer Graphics may be used
6. Textual material and pictures/art work will be used to illustrate topic
7. Charts & graphs will be used for illustration
8. Students will strive for a visually balanced presentation of information.
9. Basic Information to be included:
 - Introduction of topic
 - Taxonomy chart
 - Diagrams/photographs
 - Reproductive cycle mapped/ identified
 - Summary of research/ worksheet information

Rubric for Backboard Display

Category	4	3	2	1	Rating
Overall Construction/ Appearance	Shows considerable effort in construction; items are neatly trimmed; no stray marks, smudges, or glue stains; all items are carefully secured to the backing; nothing is hanging over the edges.	Shows attention to construction; items are neatly trimmed; all items are carefully secured to the backing; a few barely noticeable stray marks, smudges, or glue stains; nothing hanging over edges.	Shows some attention to construction; most of the items are neatly trimmed; all items are securely attached to the backing; a few noticeable stray marks, smudges, or glue stains; no edges hanging over.	Was put together sloppily; items appear to be just "slapped on"; pieces may be loose or hanging over the edges; many stray marks, smudges, or glue stains.	
Attention to Topic/ Theme Requirements	Fully follows project guidelines/requirements; all items & text in direct reference to topic or theme.	Most of the guidelines & requirements are followed; most of the items and text directly relate to the topic or theme.	Some of the requirements have not been met; some of the items & text directly relate to the topic or theme.	Many of the requirements have not been met; some of the items do not relate directly to the topic or theme.	
Time and Effort	Class time was used wisely; much time & effort went into the planning & design as well as gathering information; work was done at home as well as at school.	Class time used wisely; time & effort went into the planning & design as well as gathering of information; more time & effort could have been put in at home.	Class time not always used wisely; some time & effort went into the planning & design as well as gathering information; some work was done at home.	Class time was not used wisely; little time & effort went into the planning & design & gathering information; no additional time was put in at home	
Design	Graphics are trimmed to an appropriate size & arranged well; text & graphics are in nice balance & meet the set up guidelines; shows good use of color to make items stand out.	Most of the graphics are trimmed to an appropriate size & arranged well; text & graphics are in a fairly nice balance & meet most of the set up guidelines; good use of color to make items stand out.	Most graphics are trimmed to an appropriate size, but are not arranged in an attractive manner; the balance between text & graphics is off a bit; not all set up guidelines met; fair use of color.	Graphics are untrimmed or inappropriately sized; little attention given to design; balance between text & graphics doesn't exist; few of the set up guidelines are met; little color used to make items stand out.	
Text Content/ Research	Shows much research & much attention to composition; required number of sources used and cited.	Shows research & attention to composition; one less than the required number of resources used by those are cited.	Could have shown more research & attention to composition; less than the required number of sources used and/or cited	Shows little research done; lack of attention to composition & structure; number of sources used unknown; no citations	
Titles, Text, Fonts	Excellent choice of fonts for readability.	Good choice of fonts for readability.	Fair choice of fonts for readability.	Fonts cannot be clearly read; mix matched	

Teacher comments: _____

Rubric for Power Point Presentation

Category	4	3	2	1	Rating
Overall Composition/ Appearance	Shows considerable effort in construction & appearance of the program; careful attention to organization presentation,; holds audience interest	Shows effort in construction & appearance of the program; careful attention to organization of presentation; holds audience interest	Shows some effort in construction & appearance of the program; presentation is organized; somewhat boring/confusing	Effort to construct a meaningful program is lacking; organization is poor	
Attention to Topic/ Theme Requirements	Fully follows project guidelines/requirements; all items & text in direct reference to topic/theme	Most of the guidelines & requirements are followed; most of the items & text directly related to the topic/theme	Some of the requirements have not been met; some of the items & text not directly related to topic/theme	Many of the requirements have not been met; some of the items & text not directly related to topic/theme	
Time & Effort	Class time was used wisely; much time & effort went into the planning & creation of the program; much additional work was done at home	Class time used wisely; time & effort went into the planning & creation of the program; additional work was done at home	Class time was not always used wisely; more time & effort could have gone into planning & creation of the project; some work done at home.	Class time was not used wisely; little time & effort went into planning & creation of program; no work done at home.	
Design	Well thought-out design; visually attractive; variety within the presentation; excellent use of technology	Well thought-out design, visually attractive; variety within the presentation; good use of technology	Well thought-out design, visually attractive; some variety within the presentation; meets minimum technology requirements	No clear design; lacks variety within the presentation; barely meets minimum technology requirements	
Text Content/ Research	Shows much research & much attention to detail; shows excellent comprehension of topic/theme; more than the required number of sources used & cited.	Shows research & attention to detail; shows good comprehension of topic/theme; required number of sources used & cited	Could have shown more research & attention to detail; comprehension of topic/theme has gaps or is out of sequence; less than required number of sources used and/or cited.	Shows little research done; attention to detail minimal or missing; comprehension of topic/theme is lacking; use of sources and/or citations are missing	
Titles/ Text Fonts, Backgrounds & Views	Fonts for titles & text are well chosen for readability; text & titles varied in font & size; Slide views had variety, color was used to enhance presentation	Fonts for titles & text are well chosen for readability; text & titles varied in font & size; slide views had some variety; color was used to enhance presentation	Fonts for titles & text are not all well chosen for readability; text & titles do not vary from slide to slide; slide views have no variety; color is not used	Fonts for titles/text appear to be chosen because they are "cool" or different; difficult to read; no variety in slide views; color is not used	

Teacher comments: _____

Rubric for An Oral Presentation

Category	4	3	2	1	Rating
Comprehension	Presenter is 100% accurate in the information presented; presenter is able to accurately answer almost all questions posed by listeners about the topic(s)	Presenter is 90% accurate in the information presented; presenter is able to accurately answer most questions posed by listeners about the topic(s)	Presenter is 80% accurate in the information presented; presenter is able to accurately answer a few questions posed by listeners about the topic(s).	Presenter is 70% or less accurate in the information presented, or is unable to accurately answer questions posed by listeners about the topic(s).	
Preparedness	Presenter is completely prepared & has obviously rehearsed.	Presenter seems pretty well prepared, but could have reviewed his/her information a bit longer.	Presenter is somewhat prepared, but it is clear that much more time rehearsing/going over presentation before class was needed.	Presenter does not seem at all ready to make oral presentation	
Speaks Clearly (* uhmmm, like, you know, well, etc.)	Speaks clearly & distinctly 90-100% of the time, & mispronounces no words; smooth presentation with no stumbling (*)	Speaks clearly & distinctly 80-89% of the time, but mispronounces a couple of words; presentation with very few stumbles.(*)	Speaks clearly 70-79% of the time; mispronounces some words/; presentation has some stumbles. (*)	Often mumbles or can not be understood; mispronounces several words; presentation is continually scattered with stumbles.(*)	
Content	Shows full understanding of the topic; factual content excellent & reflects good research.	Shows good understanding of the topic; factual content good, but needed more details on one or two parts.	Shows a good understanding of parts of the topic; factual content could have contained many more details/examples; more research needed	Doesn't seem to understand the topic well; lack of detailed, factual information shows little research.	
Time Limit/Stays on Topic/Sequencing	Presentation length is within the correct range; stays on topic all of the time; details/information placed in logical order & effectively presented.	Presentation is either a bit too long or short; stays on topic 90-95% of the time; details in logical order, but could have been presented in a more enthusiastic/interesting way	Presentation length is somewhat short of requirements; stays on topic 80-85% of the time; details/information not in logical order & makes for some confusion.	Presentation is; much too short; not on topic; lack of detailed information; ideas not clearly connected	
Posture, Eye Contact, Pauses	Stands up straight; looks relaxed, maintains eye contact with audience; pauses used to improve meaning & impact; 0-2 check of notes	Stands up straight; a bit nervous; good eye contact with audience;; pauses a few times to improve meaning & impact; checks notes a few times.	Sometimes stands up straight; more eye contact with audience needed; refers to notes often; pauses 1-2 times to improve meaning & impact.	Slouches, leans against something; does not look at audience; reads from notes; doesn't pause for emphasis or to improve meaning	

Rubric for Collaborative Groups

Category	4	3	2	1	Rating
Contributions	Routinely provides useful ideas when participating in a cooperative group. A definite leader who contributes a lot of effort	Usually provides useful ideas when participating in a cooperative group; a strong member who tries hard	Sometimes provides useful ideas when participating in a cooperative group exercise; group member who does what is required	Rarely provides useful ideas when participating in a cooperative group; may refuse to participate or be helpful in any way	
Quality of Work	Provides work of the highest quality	Provides high quality work	Provides work that occasionally needs to be checked/or redone by other group members to ensure quality	Provides work that usually needs to be checked/redone by others to ensure quality	
Time Management	Routinely uses time well; neither timeline nor work responsibilities have to be adjusted because of this student's procrastination	Usually uses time well throughout the project; neither timeline nor work responsibilities have to be adjusted because of this student's procrastination	Tends to procrastinate but always gets things done by the deadline; timelines and work responsibilities do not have to be adjusted because of this student	Rarely gets things done by the deadlines and group has to adjust deadlines and work responsibilities because this student's lack of time management	
Focus on Task	Constantly stays focused on topic and task and what needs to be done; very self-directed.	Focuses on the topic and task and what needs to be done most of the time; other members of the group can count on this person	Focuses on the topic and task and what needs to be done some of the time; other group members must sometimes nag, prod, and remind to keep this student on task	Rarely focuses on the topic or task and what needs to be done; lets others do the work	
Pride and Attitude	Work reflects student's best efforts; never publicly critical of the project or the work of others; always has a positive attitude about the task(s)	Work reflects a strong effort; rarely is publicly critical of the project or the work of others; often has a positive attitude about the task(s)	Work reflects some effort from the student; occasionally is publicly critical of the project or work of other members of the group; usually has a positive attitude	Work reflects very little effort on the part of the student; often is publicly critical of the project or other members of the group; often has a negative attitude about the task(s)	
Working with Others	Almost always listens to , shares with, & supports the efforts of the others in the group; tries to keep people working together	Usually listens to, shares with, and supports the efforts of the other members of the group; does not cause "problems" within the group	Often listens to, shares with, & supports the efforts of the other members of the group; sometimes does not practice team work	Rarely listens to, shares with, or supports the efforts of the other members of the group; does not practice team work	

Teacher's Comments: _____

DIRECTIONS FOR ORAL PRESENTATION

With your lab partner, prepare a 5 minute oral presentation with a visual component such as a backboard or power point program on a specific fungus.

The presentation must:

1. Identify the distinguishing features of the Kingdom Fungi
2. Compare/Contrast Fungi to Kingdom Protista; Kingdom Plantae
3. Identify the specific fungus you have researched by scientific name (genus, species). Does it have a common name?
4. Show the structural features of a specific fungus
5. Classify that specific fungus: Kingdom, phylum, class, order, family, genus, and species
6. Identify that specific fungus as harmful or helpful and explain how it is helpful or harmful
7. How do fungi reproduce?
8. How are fungi similar/different from molds? From Yeasts?
9. Where would you look to find this particular fungus?

Rubric for Microslide Lab

Category	4	3	2	1	Rating
Accuracy	90 - 100% accurate; answers are in complete sentences where appropriate; no spelling, grammar, or punctuation errors; demonstrates an excellent understanding of subject diagrams are labeled correctly	80 - 89% accurate; answers are mostly in complete sentences where appropriate; no spelling, grammar, or punctuation errors; demonstrates a good understanding of subject; most diagrams are labeled correctly	70 - 79% accurate; some answers are in complete sentences where appropriate; some spelling, grammar or punctuation errors; demonstrates that there is some confusion in understanding of subject; some errors in labeling diagrams	60 - 69% accurate; complete sentences are not used; many spelling, grammar or punctuation errors; demonstrates that there is little understanding of subject; diagrams have not been labeled	
Completeness	All parts of the lab have been completed; all drawings are complete	Most parts of the lab have been completed; most drawings are complete	Some parts of the lab have been completed; not all drawings have been completed	Many missing parts of the lab; drawings are not present	
Use of Color	Color was used appropriately in the diagrams to reflect observations and to clarify structures	Color was used to clarify reflect observations; structures are somewhat unclear	Color choice did not accurately reflect observations	Color was not used	
Neatness	All aspects of the lab are neat & easily read; care and thought is reflected in this work	Most aspects of the lab are neat & easily read; some care and thought is reflected in this work	Some aspects of the lab are neat & easily read; there are parts that do not reflect care & thought	This lab is sloppy & hard to read; it looks as if the work was rushed; does not reflect care & thought	

Teacher comments: _____

NAME _____
DATE _____
CLASS/GROUP _____

THE FIVE KINGDOMS OF LIFE

INTRODUCTION:

In this unit you will learn about the system used by scientists to classify all living things. You will use the Micro-Slide- Viewer, Microslide and Text Folder

Read and follow the directions for use of the Micro-Slide-Viewer and Microslide on the envelope attached to the text folder holding the slide

Examine each slide and study the description in the text folder. After studying each slide and printed text, answer the questions for that slide on this worksheet. If you don't know the answer, go to the next slide and question(s). You may find the answer as you learn more about the subject. When requested, draw what you see in the space provided.

(a) Scientists now place all living things into one of five kingdoms. The kingdoms are:

_____, _____, _____,
_____ and _____.

(b) List two factors used in classifying organisms into kingdoms

_____ and _____.

(c) How do members of the Kingdom Monera differ from all other living things?

(d) What do members of the Fungi Kingdom have that members of the animal kingdom lack? _____

SLIDE 1: EUGLENA

(a) Draw what you see in this slide

(b) How many cells does euglena have? _____

(c) Name two other distinctive features of

Euglena _____

and _____

(d) In what kingdom does euglena belong?

(You should study the entire lesson before answering.)

SLIDE 2: THE KINGDOM MONERA

(a) Bacteria are classified as Monerans. Two major traits of monerans are that

they _____ and _____

(b) Where do these bacteria most frequently live? _____

SLIDE 3: THE KINGDOM MONERA

(a) Unlike typical bacteria, the monerans in this slide can _____

(b) The organism seen here lives in damp environments. How does it protect itself from drying out?

SLIDE 4: THE KINGDOM PROTISTA

(a) Name two characteristics found in all protista. _____ and _____

(b) Is the organism seen in this slide more like an animal or like a plant? Explain your answer.

SLIDE 5: THE KINGDOM PROTISTA

- (a) Draw what you see in this slide. Label the cell wall and chloroplasts.
- (b) What happens at the "bridge"? _____

- (c) Is this organism plant-like or animal-like?

- (d) Explain your answer to (c) above. _____

SLIDE 6: THE FUNGUS KINGDOM

- (a) Name two characteristics of fungi that make them different from plants. _____
_____ and _____
- (b) What is the function of the hyphae? _____
- (c) Where is food digested in a fungus? (externally) or (internally) (Underline your choice)

SLIDE 7: THE PLANT KINGDOM

- (a) Draw what you see in this slide
- (b) Why aren't the small green chloroplasts in the Elodea present in the skin of the onion at the left side of the slide? _____

- (c) Name two functions of the cell wall. _____
_____ and _____

SLIDE 8: THE ANIMAL KINGDOM

- (a) Animal cells lack chlorophyll and cell walls but have _____
And develop from the _____
- (b) What are the pink regions of this slide? _____
- (c) What is the purple region near the center of the cell? _____

