

## TREE-RINGS and FOREST FIRE ECOLOGY

### Many Forests, Many Fires, Many Stories

**Situation:** Over the past 30 years, acres upon acres of forests have been consumed by wildfires. As a result, the percentage of forested land, such as Pine forests, has been drastically reduced. In addition to the destruction of natural ecosystems, there has also been billions of dollars in damage to people's homes and businesses, as well as lives lost. The intensity of these fires is much greater than in the past, and the occurrence of these large wildfires is more frequent.

**Your Role in the Investigation:** As research scientists, it is your job to *investigate* the situation. It is your duty to explore this current pattern of massively destructive wildfire through labs, projects, guest presenters, collaboration, and research to help you understand the following questions:

Type of Question	Question Stem
Why...	<ul style="list-style-type: none"><li>• has the pattern of wildfires changed to more intense and destructive in more recent times?</li></ul>
Where...	<ul style="list-style-type: none"><li>• are the areas that areas that are most affected by these wildfires?</li><li>•</li></ul>
How...	<ul style="list-style-type: none"><li>• is the amount of damage measured after a wildfire?</li><li>• much damage to these wildfires cause?</li><li>• is the forest changed after these wildfires?</li></ul>
Who...	<ul style="list-style-type: none"><li>• is affected by wildfires?</li><li>• are the scientists that study wildfires?</li></ul>
What...	<ul style="list-style-type: none"><li>• do tree rings tell us about wildfires (both present and past)?</li><li>• are the effects of massive wildfires to the environment and to humans?</li><li>• can be done to save our forests and protect ourselves from catastrophic wildfires?</li></ul>

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#### **Conclusions: (The following 2 tasks will be the final part of this camp)**

1. After you have completed your research, you will be presenting your findings in a video you will construct with your other scientist colleagues. You may tell your research in the form of a story that takes on a theme (ex. action/adventure, horror, comedy...etc). The questions above will help you with your script, and should be answered during your video.
2. Within the video, you must do at least one of two things to help you conclude your thoughts on the situation based on your professional opinion and research. The first thing you may do is make a recommendation about what you think should be done to help improve this situation. The second option you may take is to describe what is already being done by local/federal governments to help improve this situation. You may explain both your own recommendations as well as what is already being done about the wildfires if you like.

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## Monday

Day 1 – July 6 <sup>th</sup> , 2015 – TR Classroom				
Time	Activity	Speaker or Presenter	Materials Needed	Activities
8:00-9:00am	<ul style="list-style-type: none"> <li>• Ice Breaker (45 min)</li> <li>• Vocab Wall/Question Wall Intro (5 min)</li> <li>• Intro to Case Study Investigation (10 min)</li> </ul>	Brittany and Scott	<ul style="list-style-type: none"> <li>-Question Ball</li> <li>-Word Wall</li> <li>Vocab sheets</li> <li>-Case study sheets</li> </ul>	<ul style="list-style-type: none"> <li>-Write vocab words on bit stickies and place on wall</li> <li>-Play ice breaker</li> </ul>
9:00-10:00am	<b>Story Telling Intro</b>	Scott	<ul style="list-style-type: none"> <li>-Large Poster Paper</li> <li>-sticky notes (large and small)</li> </ul>	<ul style="list-style-type: none"> <li>-Intro to story elements</li> <li>-Investigation of genes of stories</li> <li>-Selection of genre</li> </ul>
10:00-11:00	<b>Intro to Filming</b>	Mike Griffith	<ul style="list-style-type: none"> <li>-Mini-ipads</li> <li>-Microphones</li> <li>-Tripods</li> </ul>	<ul style="list-style-type: none"> <li>-learning to film properly using ipads</li> </ul>
11:00-12:00	<b>What is a Catastrophe?</b>	Scott	<a href="http://www.einsteinproject.org/for-educators/unit-offerings/catastrophic-events/">http://www.einsteinproject.org/for-educators/unit-offerings/catastrophic-events/</a>	<ul style="list-style-type: none"> <li>-Girls research different catastrophes</li> <li>-Scott instructs them on what a true catastrophe is.</li> <li>-Focus leads to the girls eventually determining whether or not they think the large wildfires that sweep through Pine forests in the SW are catastrophes?</li> </ul>
12:00-1:00pm	Lunch			
1:00-2:00pm	<b>TR tour with Josh Meet the dendrochronologists/Josh Q &amp; A</b>	Josh	Mini-ipads	<ul style="list-style-type: none"> <li>-Picture taking/interviewing</li> </ul>

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	-Tour of tree ring labs/a day in the life of a dendrochronologist			
1:00-2:00	<b>Tree Cookie Lab</b> <ul style="list-style-type: none"> <li>This involves both the MS application and the HS application</li> </ul>	Brittany	-Tree Cookie pictures -Tree Cookie handouts -Lab notebooks -demo data table -magnifying glasses -rulers	-Students observe fire scars on tree cookie -Students record data in lab notebook -Students answer questions -Students film their conclusion answers
3:00-4:00	<ul style="list-style-type: none"> <li><b>Wildfire Regime Change Activity (35-45 mins)</b></li> <li><b>Fire Triangle Activity (15-20 mins)</b></li> </ul>	Brittany	-Powerpint -Straws, toothpicks, cubes -handout of fire occurrence/severity graphs -lab notebooks -fire triangle graph -fire triangle handout -matches, clips, dry ice, mason jars, tea lights	-Students follow activities and answer questions -Students film themselves describing their conclusion answers.
4:00-5:00pm	<b>Story mapping time</b>	Scott	-mini-ipads -story mapping posters -sticky notes	-discussing where the things they have learned will fit into their story map -re-visit case study intro -outlining how they will tell their story

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**Tuesday**

<b>Day 2 – July 7th, 2015 – TR Classroom</b>				
<b>Time</b>	<b>Activity</b>	<b>Speaker or Presenter</b>	<b>Materials Needed</b>	<b>Approach</b>
8:00-9:00am	<b>Campus Tour</b>	Sara	-mini-ipads	-girls walk around and get a feel for the Univeristy.
9:00-10:00am	<b>Fires and Dendrochronology Intro</b>	Josh	-Josh’s Poweprint -Mini-Ipads -Index cards -Lab Notebooks	-Girls actively listen -They write questions on their cards (clarifying or deeper questions) -Identify slides where they want Josh to go over in the next hour for interview
10:00-11:00	<b>Interview Josh</b> *Josh leaves the room for 10-15 minutes	Josh	-Mini-ipads -Index cards from previous hour -Lab Notebooks -Story Maps	-girls review/come up with questions to interview Josh using -Interviewing Josh in front of Sequoia -Pictures of Powerpoint slides -Girls interview each other explaining
11:00-12:00	<b>Story Mapping Time</b>	Scott	-mini-ipads -story mapping posters -sticky notes	-discussing where the things they have learned will fit into their story map -re-visit case study intro -outlining how they will tell

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				their story
12:00-1:00pm	<b>Lunch</b>			
12:00-1:00	<b>Popplet Description and Intro to Fire Ecology Vocab</b>	Brittany	-Mini-ipads -Popplet BINGO scavenger hunt template -Videos of some vocab words	-girls listen to what their task will be for BINGO scavenger task the next day -girls practice with items around the 1 <sup>st</sup> floor and outside of the tree ring lab
1:00-2:00pm	<b>Climate Presentation</b>	Valerie	-Valerie's Powerpoint -Mini-ipads -index cards for questions	-girls actively listen and take pictures -girls use index cards to make clarifying or deeper questions
2:00-3:15	<b>Story Mapping and cleaning room to leave for Bio East at 3:15</b>	Scott	-mini-ipads -story mapping posters -sticky notes	-discussing where the things they have learned will fit into their story map -re-visit case study intro -outlining how they will tell their story
3:30-4:30/5ish	<b>GIS Lesson</b>	Yoga and Jane (Brittany)	-Mini-ipads -Lab notebooks -Folders with case study info in them -GIS software and in GIS lab	-create a burn severity map for Aspen fire -answer questions about how scientists use these maps to study the effects of fire

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## Wednesday

Day 3- July 8 <sup>th</sup> , 2015 – Mt. Lemmon				
Time	Activity	Speaker or Presenter	Materials Needed	Approach
7:30-9:00am	<b>Travel to Mt. Lemmon</b>	Josh, Brittany, Scott	-Mini-ipads -colored pencils -pencils -lab notebooks -hiking materials (sunscreen, water, shoes, hats, etc.) -clip boards -graph paper -caution tape or string -Snacks -lunch meat -bread	
9:00-10:00am	<b>Hike</b>	Josh	-mini-ipads	-girls take pictures -BINGO scavenger hunt -Josh points out areas of interest
10:00-11:00am	<b>Graph Mapping Activity</b>	Scott	-clip boards -colored pencils -string or caution tape -graph paper -measurement tools (?)	-girls survey their space for specific points of interest (mature trees, young trees, doghair thicket, closed canopy...etc.)
11:00-12:00	<b>Plants Count</b>	Scott		
12:00-1:00pm	<b>Lunch</b>		-Lunch meat -bread -snacks	
1:00-2:00pm	<b>Tree coring and mounting</b>	Josh	-Tree Cores - Glue -Wooden Mounts -Swedish Increment Borer	-girls core trees -girls mount tree cores -filming
2:00-3:00pm	<b>Driving to Different Points of Interest Regarding Fire</b>	Josh	-Mini-ipads	-Taking pictures and videos

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3:00- 4:30	<b>Drive Back to U of A and Parent Pick-up</b>			
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### Thursday

Day 4 – July 9th, 2014 – TR Classroom				
Time	Activity	Speaker or Presenter	Materials Needed	
8:00-9:00am	<b>Debrief from Mountain Trip</b>	Scott and Brittany	-Mini-ipads -Popplet BINGO scavenger hunt templates	-sharing scavenger hunt -filming what you remember about tree coring
9:00-10:00am	<b>Story Mapping</b>	Scott	-mini-ipads -story mapping posters -sticky notes	-discussing where the things they have learned will fit into their story map -re-visit case study intro -outlining how they will tell their story
10:00-11:00	<b>Video Editing</b>	Mike Griffith	-Mini-ipads -Story maps	-Students learn to edit their videos -Use story map outlines to guide them
11:00-12:00	<b>Story Mapping and Video Editing</b>	Scott	-mini-ipads -story maps -sticky notes	-girls edit their videos -re-do videos -finish story maps
12:00-1:00pm	<b>Lunch</b>			
1:00-3:00pm	<b>Matchstick forest lab</b>	Alex and Brittany	Lab, videos, pictures, clay, blocks, cookie sheets, matches (all sizes), hay, pin board, data tables on google doc account	-Hands-on interaction -girls record data -film conclusions
3:00-5:00pm	<b>Story Mapping and Video Editing</b>	Scott	-Mini-ipads -story maps	-mapping and editing

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**Friday**

<b>Day 5 – July 10<sup>th</sup>, 2015 – TR Classroom</b>				
<b>Time</b>	<b>Activity</b>	<b>Speaker or Presenter</b>	<b>Materials Needed</b>	
8:00-9:00am	<b>Researching and Conclusions</b>	Brittany	-Mini-ipads -Lab notebooks -folders -story maps	-girls take all the information they have gather to answer and script the 2 conclusion questions. -film their conclusions
9:00-12:00pm	<b>Story Mapping and Video Editing</b>	Scott	-Mini-ipads -Story maps	-girls edit and complete their movies
12:00-1:00	<b>Luncheon with Parents</b>			
1:00-2:00pm	<b>Video Presentation</b>	Scott, Brittany, and the teams of girls	-Final Videos -Mini-ipads -Projectors	-Girls intro their stories -Girls show their videos that they made