**Resources for teaching Climate Change, all ages**

**Cynthia Cudaback. PhD, January 2010**

**Overview:**

I teach whomever, whatever, wherever they need me. For a hot topic like climate change, I could be working with kindergarten, middle school or adults. My only paid gigs this year happen to be climate change presentations for middle school Girls in Science clubs, but I have discussed the topic with the League of Women voters and the Encore program for lifelong learners. My other reason to choose climate change is that I have a huge collection of e-mails from Scuttlebutt on the topic (about half the messages are from Vicki Osis).

 Some parts of this project were awkward for me. Instead of relating resources to my course objectives, I listed learning objectives for the particular resource. Some are quoted directly from the source. Aligning with the NCSOS required me to look through a huge variety of standards from different grades

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| **1) Title & Source** | Earth Has A FeverDiana Madson, California Coastal Commission<http://www.coastal.ca.gov/publiced/directory/earthhasafever.pdf> |
| **Objectives****& Grade**  | Kindergarten students will be able to:* identify connections between human activities
* identify natural resources and conservation of resources.
* distinguish between land and water on the globe.
 |
| **OL**  | 1, 6 |
| **NCSOS****Guidelines** | National Association for the Education of Young ChildrenDevelopment of social, language, creative and science skills |
| **Type of** **Resource** | Lesson plan, with discussion script and patterns for “mother earth” masks |
| **Instructional****Approaches** | Using puppets as props to engage children in brainstorming and expressingtheir ideas after having it modeled by the teacher. |
| **Level of Engagement** | Knowing, applying, creating (painting a mask is creative, but not at a high level on Bloom’s taxonomy) |
| **What it Does** | Topics mentioned in script:* teacher shows land and water on a globe/mask
* kids discuss nature
* teacher describes global warming
* kids brainstorm ways to help the earth
* kids make mother earth masks to spread the word
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| **2) Title & Source** | North/South, by C. Cudaback<http://oceanandyou.com/OnlineContent/Resources.html> (bottom of page) |
| **Objectives****& Grade**  | Elementary school students will be able to:* describe differences between the north and south pole
* identify habitats of polar bears and penguins
* correctly assemble cut and paste worksheet about differences
* predict the effect of Arctic ice melt on sea level rise
 |
| **OL**  | 1, 3 |
| **NCSOS****Guidelines** | Grade 4 goal 1.01 – effects of environment on animals |
| **Type of** **Resource** | Lesson plan, cut & paste worksheet, handoutInformation for teachers of grades K-8 |
| **Instructional****Approaches** | Hands-on with globes and critters, acting out behaviors, worksheetDemonstration, calculation |
| **Level of Engagement** | Knowing, understanding, applying,  |
| **What it Does** | Collection of ideas I discussed with teachers at a climate change workshop. |

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| **3) Title & Source** |  Climate Kids – Eyes on Earth. <http://climate.nasa.gov/kids/>especially: “what is happening in the ocean?” |
| **Objectives****& Grade**  | Grade 4-6 students will be able to: |
| **OL**  | 3, 4, 1 |
| **NCSOS****Guidelines** | Touches on all the Grade K-5 unifying concepts: Systems, Order and Organization.  Evidence, Models, and Explanation.  Constancy, Change, and Measurement.  Evolution and Equilibrium.  Form and Function. |
| **Type of** **Resource** | Website – various online interactives, images, video, and content. |
| **Instructional****Approaches** | Lots of written material – essentially an online text |
| **Level of Engagement** | Hard to say – no evaluations or activities are offered |
| **What it Does** | It’s a very good text, but definitely not stand-alone |

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| **4) Title & Source** | Climate Change: What’s up with that? By C. Cudaback |
| **Objectives****& Grade**  | Middle students will be able to:* explain the effect of CO2 on climate
* list several sources of CO2
* know that CO2 concentration is significantly higher than ever before
* name specific things they could do to reduce their carbon footprint
 |
| **OL**  | 3gt, 6e, 6g |
| **NCSOS****Guidelines** | Grade 6 goal 1: scientific inquiryGrade 6 goal 6: energy transer |
| **Type of** **Resource** | Powerpoint developed for middle school Girls in Science clubTo be used with demonstrations of* effect of melting ice on sea level (Arctic Vs Antarctic)
* effect of heating on sand and water
 |
| **Instructional****Approaches** | Lecture, to be combined with demos and discussion |
| **Level of Engagement** | Comprehending, applying, analyzing |
| **What it Does** | The best part is getting kids talking about whether and why (not) they can walk to school – it’s mostly fear of strangers. Carpooling looks like a viable option for many kids. One teacher commented that they would now have some answers for climate change deniers. |

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| **5) Title & Source** | Climate Change Wildlife and Wildlands: A Toolkit for Formal and Informal Educatorsat: <http://www.globalchange.gov/resources/educators/toolkit>This resource was developed through interagency support - led by EPA, including participation of NASA, NOAA, US National Park Service, US Forest Service, US Fish and Wildlife Service and Bureau of Land Management |
| **Objectives****& Grade**  | Middle school students will be able to:* describe the effect of subsidence on sea level rise
* explain effects of humans and water level on diamondback terrapin
* define a watershed
* demonstrate how topographical map contours model the landscape
* describe how changes in water level distribute over land features.
 |
| **OL Principles** | EP2: shape earth’s features, FC b& dEP3: climate, FC g EP6: oceans & humans, FC e, f, g |
| **NCSOS****Guidelines** | Grade 4, goal 1: effects of environment on animalsGrade 8: hydrosphere |
| **Type of** **Resource** | Readings & activities |
| **Instructional****Approaches** | Hands on, building model, studying maps |
| **Level of Engagement** | Knowing, comprehending, applying, analying |
| **What it Does** | Spiffy map interface allows one to choose a region. I’ve described East Coast above. Looks like a great resource. |

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| **6) Title & Source** | DLESE Teaching Box, "Global Ups and Downs" <http://www.teachingboxes.org/seaLevel/index.jsp>  |
| **Objectives****& Grade**  | Middle and high school students will be able to:* design and conduct experiments to determine the differences in sea level change between the melting of sea ice and continental ice
* describe glacial evidence for sea level change
* describe fossil evidence for sea level change
* describe effects of topography on sea level change.
 |
| **OL Principles** | 1,2,3 |
| **NCSOS****Guidelines** | AP Environmental Sciences, 1.02 design and conduct investigations |
| **Type of** **Resource** | 6 lesson plans |
| **Instructional****Approaches** | Experiments, readings, working with maps, web based exploration |
| **Level of Engagement** | Creating and evaluating! They design their own experimentsComprehending and applying |
| **What it Does** | Combines 6 lessons on climate change and sea level. It’s got a good variety, and I’d definitely use it if I were teaching a class |

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| **7) Title & Source** | The NOAA Year of Science Education "Sampler"<http://oceanservice.noaa.gov/education/yos/>Specifically, Climate Change and coral Activities<http://oceanservice.noaa.gov/education/yos/lesson/Grades%205-8/climatechng_sa.pdf> |
| **Objectives****& Grade**  | Middle and high school students will be able to:* Understand Climate Change and its impacts on the world’s oceans
* Realize that fossil fuel emissions are responsible for this warming trend
* List alternative forms of energy, specifically renewable energy
* reduce your energy consumption and encourage others to do the same
 |
| **OL**  | 3,6,5 |
| **NCSOS****Guidelines** | Theme: science and societyAP environmental science 2: interdependence of earth’s systemsAP environmental science 6” global changes and their consequences |
| **Type of** **Resource** | Website has wide variety, including lesson plans for grades 3-12 |
| **Instructional****Approaches** | Demonstrated experiments, reading, videos |
| **Level of Engagement** | Knowing, understanding – could be improved by more student participation in process |
| **What it Does** | Students do three experiments1. use an indicator to observe effect of CO2 on acidity (cool!)
2. another version of glaciers and icebergs
3. thermal expansion
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| **8) Title & Source** | NOAA page on coral reefs has lots of useful links<http://coralreefwatch.noaa.gov/satellite/education/>Specifically, Hands-On-Oceanography<http://www.tos.org/oceanography/issues/issue_archive/issue_pdfs/22_2/22.2_parker.pdf><http://www.tos.org/oceanography/issues/issue_archive/issue_pdfs/22_2/parker_worksheet.pdf> |
| **Objectives****& Grade**  | Middle and high school students will be able to:* use satellite images to observe winds and sea surface temperatures
* identify warm temperature anomalies from time series data
* predict coral bleaching from heat stress
 |
| **OL**  | 3,5,6 |
| **NCSOS****Guidelines** | Science as inquiry theme, AP ES 2: interdependence of systems, APES 6: changes and their consequences |
| **Type of** **Resource** | Download article and worksheet from Oceanography Journal(they have a nice variety of hands on lessons) |
| **Instructional****Approaches** | Hands on, real data |
| **Level of Engagement** | Understand, apply, evaluate |
| **What it Does** | I love that it uses real data, but indicates specific locations and dates when the data are known to be interesting. |

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| **9) Title & Source** | NOAA professional development page on climate<http://oceanservice.noaa.gov/education/pd/climate/welcome.html>has lots of lesson plans, including “are you getting thirsty?”<http://oceanservice.noaa.gov/education/lessons/getting_thirsty.html> |
| **Objectives****& Grade**  | High school students will: define “drought” and explain how drought conditions may affect coastal ecosystems.  discuss how drought conditions correlate with water temperature changes in the tropical Pacific Ocean.  use various data sources to investigate stream-flow and drought conditions in selected locations. |
| **OL**  | 3,4 |
| **NCSOS****Guidelines** | AP ES 2 &6: systems and changes |
| **Type of** **Resource** | Lesson plan |
| **Instructional****Approaches** | Worksheet on ecosystems, background reading |
| **Level of Engagement** | understanding, applying |
| **What it Does** | Students fill out worksheet on drought as an ecosystem stressor then discuss results. Can write essays about personal experience with drought |

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| **10) Title & Source** | NOAA professional development page on climate<http://oceanservice.noaa.gov/education/pd/climate/welcome.html>has lots of lesson plans, including “earth’s energy budget”<http://oceanservice.noaa.gov/education/lessons/earth_energy_budget_lesson.html> |
| **Objectives****& Grade**  | Grade 9-12 students will* accurately describe the absorption and re-radiation of energy by the earth, including fractions reflected and absorbed
 |
| **OL**  | Climate literacy |
| **NCSOS****Guidelines** | National standards: earth science, structure of the earth system, temperature and heat |
| **Type of** **Resource** | Lesson plan |
| **Instructional****Approaches** | Demonstrations of heat absorption by water and by black and white fabric, followed by online tutorial. |
| **Level of Engagement** | Understanding – can’t go much higher with demos and reading |
| **What it Does** |  |

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| **11) Title & Source** | Rainforest Action Network’s Global Warming Lesson<http://www.georgiagbea.org/Teacher_Resources/LegalEnvironemnt/BusLaw_FOD2009/Environment%20Law/Global%20Warming/An%20Inconvenient%20Truth%20Lesson%20Plan.pdf> |
| **Objectives****& Grade**  | Middle and high school students will be able to:* actively participate in stopping climate change
* develop skills in working together.
 |
| **OL Principles** | 3,6 – more climate literacy |
| **NCSOS****Guidelines** | AP ES 2&6Writing and revising |
| **Type of** **Resource** | 4 page printable lesson plan, refers to RYSE toolkit which is not provided |
| **Instructional****Approaches** | Preparatory writing, watch movie, write again, share. Good questions are given as prompts |
| **Level of Engagement** | Knowing, understanding, applying, evaluating, creating (they have to think of solutions) |
| **What it Does** | Students watch An Inconvenient Truth together, reflect on what they learned, share and discuss possible solutions |

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| **12) Title & Source** | The Green Mile to School<http://www.scribd.com/doc/2619512/An-Inconvenient-Truth-Study-Guide-All-3-Tiers> |
| **Objectives****& Grade**  | High school students will be able to:* describe impacts of vehicle choice and use on climate change
* describe effects of government and corporate policy on c.c.
* calculate CO2 emissions from gas mileage
* construct a concept map relating policies behaviors and warming
* evaluate options for reducing greenhouse gasses
 |
| **OL Principles** | None really, all CL |
| **NCSOS****Guidelines** | AP environmental science: 1.03 formulate and revise scientific explanations4.05 analyze and compare conventional and alternative energy sources |
| **Type of** **Resource** | 59 page study guide in awkward on-screen format. If printable, quite useful. Includes scoring rubric for science presentations and concept maps |
| **Instructional****Approaches** | Concept mapping, student discussion, activities and research, final concept map |
| **Level of Engagement** | all levels  |
| **What it Does** | Multi day lesson plan, with enrichment options |

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| **13) Title & Source** | Climate Classroom<http://www.climateclassroom.org/teens/lessonplans.cfm> |
| **Objectives****& Grade**  | High school students will be able to:* articulate their way of deciding what information to trust
* articulate the values that underlie their decisions
 |
| **OL Principles** | 3 & 6 of course7 to the extent that it teaches about the nature and reliability of science |
| **NCSOS****Guidelines** | AP environmental science: 1.05 Analyze reports of scientific investigations |
| **Type of** **Resource** | Online description of class activity |
| **Instructional****Approaches** | Discussion, brainstorming, critical thinking, self evaluation |
| **Level of Engagement** | Evaluating, applying |
| **What it Does** | This is really important – getting students to articulate their decision making process. Highly recommended. My students are evenly divided between automatically trusting and distrusting government sources. This might be a chance to help them see the point of government research. |

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| **14) Title & Source** | Resource to help teachers use NASA Data<http://climate.nasa.gov/TipsandTricks/TipsNTricksTipsheet_11-20-10.pdf> |
| **Objectives****& Grade**  | Students will learn (Objectives aren’t listed – these are outcomes)* how global temperatures change over time
* how and why sea level varies over space and time
* some changes that have already occurred
* stuff about the cryosphere
 |
| **OL Principles** | 1,3 |
| **NCSOS****Guidelines** | APES 2&6: systems and change |
| **Type of** **Resource** | Downloadable guide to discussions and activities that go with various NASA data viewers |
| **Instructional****Approaches** | Watching videos compiled from data on phenomena. Lots of discussion and writing. Students may graph data. |
| **Level of Engagement** | Knowing, understanding, applying, analyzing |
| **What it Does** |  |

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| **15) Title & Source** | MY NASA Data – climate lesson plans <http://mynasadata.larc.nasa.gov/ClimChg_lessons.html>Many plans including: “Is Grandpa Right?”<http://mynasadata.larc.nasa.gov/preview_lesson.php?&passid=97> |
| **Objectives****& Grade**  | Middle school students will be able to:* access NOAA and NASA climate data from Internet resources.
* determine changes in average temperatures, precipitation and cloud cover over time from data.
* relate global changes to local changes
 |
| **OL & CL****Principles** | CL: 4-7, OL: 3 & 6 |
| **NCSOS****Guidelines** | APES 2 & 6: systems and changes |
| **Type of** **Resource** | Suggested activities with existing NASA data set; printable directions are available. |
| **Instructional****Approaches** | Data plotting, use of real data,  |
| **Level of Engagement** | Frankly I think it’s too complicated to engage students at all. Temperatures in Kelvin, forsooth! I gave a complicated talk on climate change, and the teacher said the only stumbling block for the students was that they really didn’t know how far a meter was.  |
| **What it Does** | Students look at climate indicators and trends – it’s tricky navigating, and temperatures are given in Kelvin! This might work in small groups, where students can help each other. You can’t look at two types of data at once, which is a serious problem. “The past” only extends to 1994, grandpa was already old by then. Different time axes for different data sets – yuck! |

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| **16) Title & Source** | Inconvenient TruthI’ve got a copy of this lesson of file, but I don’t know where I got it!Attached as an appendix to this file |
| **Objectives****& Grade**  | High school students will be able to:* discuss the causes and effects, the dangers and opportunities, of climate change in small groups and whole class.
* compose a working thesis for a piece on climate change
* use information imparted in class and other appropriate sources to prove their thesis in an essay, research report, PowerPoint slideshow, video, or any approved format.
* share their products with the class, the school, the district, the city, the state, the country, the world.
* experience the importance of a strong thesis in effectively communicating an important idea.
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| **OL Principles** | Relates to 3 & 6, but really more Climate literacy – touches on all points |
| **NCSOS****Guidelines** | I presume there’s a guideline about persuasive writing, which is the primary focus of this exercise. |
| **Type of** **Resource** | Lesson plan with handouts – I just spent a ridiculous amount of time cleaning up the formatting. |
| **Instructional****Approaches** | Students watch an inconvenient truth, then develop a strong argument for climate change advocacy and present it as a letter, poster, poem or whatever |
| **Level of Engagement** | It’s on the line between rhetoric and science. Rhetoric – all the way through creating. Science, maybe through applying. |
| **What it Does** | Pushes advocacy on climate change – goes a little too far even for me |

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| **17) Title & Source** | David Archer’s lectures – college level, non science major:University of Chicago<http://geoflop.uchicago.edu/forecast/docs/lectures.html>I watched just the last lecture; it takes *forever* to download |
| **Objectives****& Grade**  | College level, non science major students will* gain a broad understanding of climate change
 |
| **OL Principles** | I happen to be looking at a lecture called “hot, flat and crowded”, so OL principles aren’t mentioned at all |
| **NCSOS****Guidelines** | N/A these are college lectures |
| **Type of** **Resource** | Videos of classroom lectures, including realtime feedback from student clickers. Also a textbook for sale. Online models are cryptic |
| **Instructional****Approaches** | Lecture, clickers |
| **Level of Engagement** | Knowing and understanding – students don’t get an opportunity to demonstrate higher level engagement in a lecture |
| **What it Does** | He’s a good lecturer – I like his description of trying to collect water buckets from a ship. |

**Videos**

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| **18) Title & Source** | Ice Melt VideoGood narrated video from National Geographic Society<http://news.nationalgeographic.com/news/2008/09/080917-ice-video-vin.html> |
| **Objectives****& Grade**  | Middle school to adult |
| **OL Principles** | 1, 3, 4 |
| **NCSOS****Guidelines** | AP ES, systems and change |
| **Type of** **Resource** | Videos |
| **Instructional****Approaches** | Images and narration, lecture |
| **Level of Engagement** | Depends on the viewer |
| **What it Does** | Describes loss of perennial sea ice – in a “death spiral”. Mentions possible loss of summer sea ice by 2030! I’ve got to go see the polar bears before it’s too late. Wonder how much that trip will add to my carbon footprint? |

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| **19) Title & Source** | Ice Melt VideoVanishing ice caps from CBS news<http://www.youtube.com/watch?v=06nYSrjFNB0&NR=1&feature=fvwp>note: many school systems block YouTube |
| **Objectives****& Grade**  | High school to adult |
| **OL Principles** | 3 of course, Also everything’s connected – that isn’t an OL principle, but it should be.  |
| **NCSOS****Guidelines** | AP ES = systems and change |
| **Type of** **Resource** | Videos |
| **Instructional****Approaches** | Interview is like a Socratic dialog |
| **Level of Engagement** | Depends on the viewer – most comments are negative |
| **What it Does** | Interview with an oceanographer – he starts out by defining climate as a temporal average, and also discusses global connections among different climate issues. The profoundly illiterate anti-science comments are a sociological study in themselves. |

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| **20) Title & Source** | Glaciers & Icebergs in the lab<http://oceandrilling.coe.tamu.edu/curriculum/Sea_Level/Ice_Volume/activity.html> |
| **Objectives****& Grade**  | Students will understand that glacier melt causes sea level rise, but sea ice melt does not. |
| **OL Principles** | This has to do with fundamental physics, and isn’t mentioned in OL. Tom Garrison’s alternate list mentions the extraordinary properties of water (like why ice floats) |
| **NCSOS****Guidelines** | Sequence 1, 11th grade physics – impulse and momentum, energy and changeNature of science, science as inquiry |
| **Type of** **Resource** | Video of a lab experiment |
| **Instructional****Approaches** | Students generally think that melting sea ice will cause sea level rise. This confronts that mis-conception, but not too violently |
| **Level of Engagement** | Understanding, applying (ice in tank is like the Arctic) |
| **What it Does** | This is a personal favorite of mine. It shows clearly that melting sea ice does not affect sea level. It’s also really fun ‘cause the sea ice zips around as it melts (time lapse) |

**Other Resources**

**Videos:**

* effect of melting ice <http://www.youtube.com/watch?v=JhVDi3nIevI>
* effect of melting ice <http://vimeo.com/1611034>
* climate change and the ocean <http://www.youtube.com/watch?v=EKDzPnWWdaE>
* animations: <http://www.archipelago.co.uk/articles/climate-change-animations-launched>

**For educated adults and educators, research and advocacy**

* Climate Equity: <http://westcoastclimateequity.org/?p=3749>
* Environmental Defense: <http://www.edf.org/page.cfm?tagID=35792>
* Climate Choices: <http://www.americasclimatechoices.org/index.shtml>
* Real Climate Science: <http://www.realclimate.org/index.php/archives/2007/05/start-here/>
* Global Warming Data Art: <http://www.globalwarmingart.com/>
* How to Talk to a Climate Skeptic:  <http://gristmill.grist.org/skeptics>
* Climate Change and the Ocean: [http://www.centerforoceansolutions.](http://www.centerforoceansolutions.org/climate)

**Random Leftover bits:**

Coral Bleaching: What’s the Role of Water Temperature. <http://www.coral.noaa.gov/cleo/pdf/Bleaching%20Lesson.pdf>

Climate Change, Wildlife, and Wildlands Toolkit

For formal and informal educators

<http://www.epa.gov/climatechange/wycd/CCWKit.html>

It includes 12 minutes video and links to tool kits to explore major bioregions.

UCAR’s entry for Climate and Global Change <http://tinyurl.com/os2mle>

It is good for middle to High school students and gives a walk through of causes and issues of climate change.

The Climate Change Backpack”.

The Northeast Science Center Collaborative <http://www.sciencecentercollaborative.org/backpack.php>

Backpack full of resources, for purchase

Lynn Cherry’s book <http://www.lynnecherry.com/how_we_know_what_we_know_about_our_changing_climate__scientists_and_kids_explore_67915.htm>

**Appendix 1: stuff you need to know to do this assignment**

**Blooms Taxonomy**

 **Knowing** (repeating from memory): *list, identify, summarize, label, define*

 **Comprehending** (demonstrating understanding of terms and concepts): *explain, describe, interpret, select*

 **Applying** (applying learned information to solve a new problem): *apply, calculate, demonstrate, illustrate*

 **Analyzing** (breaking things down into their elements, formulating explanations of observed phenomena): *derive, explain, classify, test*

 **Evaluating** (choosing among alternatives and justifying the choice): *determine, optimize, select, justify, evaluate*

 **Creating** (creating something, combining elements in novel ways): *formulate, design, create, propose*

**Ocean Literacy**

1.Earth has one big ocean with many features.
2. The ocean and life in the ocean shape the features of Earth.
3. The ocean is a major influence on weather and climate.
4. The ocean makes Earth habitable.
5. The ocean supports a great diversity of life and ecosystems.
6. The ocean and humans are inextricably linked.
7. The ocean is largely unexplored.

**CLIMATE LITERACY: The Essential Principles of Climate Science**

1. The Sun is the primary source of energy for Earth’s climate system.
2. Climate is regulated by complex interactions among components of the Earth system.
3. Life on Earth depends on, is shaped by, and affects climate.
4. Climate varies over space and time through both natural and man-made processes.
5. Our understanding of the climate system is improved through observations, theoretical studies, and modeling.
6. Human activities are impacting the climate system.
7. Climate change will have consequences for the Earth system and human life.

**NC Standard Course of Study**

<http://www.ncpublicschools.org/curriculum/>

**Appendix 2: High School lesson Plan for Inconvenient Truth**

**Climate Change—A Call to Action - The Power of a Strong Thesis**

Students will formulate a thesis, develop support, and create an effective delivery system for their call to action using An Inconvenient Truth as inspiration and a data source.

One to two weeks should be set aside for this lesson

*“We will study Al Gore’s call to action concerning the environment and then you will develop your own call to action on climate change either individually or in a group.”*

**Objectives**

* Students will discuss the causes and effects, the dangers and opportunities, of climate change in small groups and whole class.
* Students will compose a working thesis for a piece on climate change
* Students will use information imparted in class and other appropriate sources to prove their thesis in an essay, research report, PowerPoint slideshow, video, or any approved format.
* Students will share their products with the class, the school, the district, the city, the state, the country, the world.
* Students will experience the importance of a strong thesis in effectively communicating an important idea.

**Materials**

* + DVD or video of An Inconvenient Truth
	+ Hardcopy/text of An Inconvenient Truth
	+ Poster board, butcher paper, or some other large material to write on (at least 4)
	+ Markers
	+ Handouts
		- SciFi or Documentary
		- Full outline of the film
		- Partial outline of film
		- Thesis construction
		- Skeleton, Support, Draft

**Product**

A strong thesis statement leading to a call to action taking any of the following forms:

Expository essay PowerPoint

Persuasive essay Play/video

Research report Poster/commercial/PSA

Documentary Poetry/music

**Day 1: Anticipatory Set**

* *Use handout/overhead/computer/ or just read the sheet to class and discuss.*

*DVD blurb #1 is a brief hyperbolic description of An Inconvenient Truth*

*DVD blurb #2 is a summary of the 1973 SciFi film Soylent Green. The film ends with Charlton Heston discovering that the government-issued food, Soylent Green, is actually made of people.*

**Handout**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Your Evening’s Entertainment: Sci Fi or Documentary**

You’re looking for a DVD rental for the evening. Here’s a choice for you:

DVD blurb #1—

If the heroes don’t do something fast the earth will drown in its own juices. Millions will be swept away in raging floods and fantastic storms. Impending doom is one choice heroic action is the other. Which will win out?

DVD blurb #2 --

The world is vastly overpopulated and this glut of humans means even more pollution. Oil prices, food costs and housing prices have escalated to such an extent that only the rich can afford air conditioning and anything other than the basic foodstuffs.

1. Which is the documentary (fact)?
2. Which is fiction?
3. Which movie would you rent? Why?
4. When do you think each was each written? Why?
5. Do you know how climate change figures in each film? How?
6. What does each make you want to do?

*We’re going to take a look at the problem of climate change with the help of Nobel prize winner Al Gore. He has been concerned about climate change for years. After a long political career ending in the 2000 loss to George Bush he devoted all his energies to these eco-concerns culminating in the Academy Award winning film, An Inconvenient Truth.*

*His call to action helped him win the Nobel and has helped jump start the ecological movement in the United States and beyond.*

*We’ll examine the film and see his expertise with the structure of the essay—yes, the essay. He knows how to construct his whole idea effectively through use of the thesis statement--antithesis, thesis, synthesis. He uses the structure of the essay you’ve been studying for years—introduction, thesis, support, and conclusion* ***and*** *he supports his thesis with details, examples, and personal narratives. Sound familiar?*

*After studying his structure and content, you will develop your own thesis statement for your Climate Change Call to Action.*

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Present information about Gore and the film.

 Ask questions such as:

* + Do you foresee any changes in the environment in your lifetime? What?
	+ What are some things you know of that can be done to reverse the damage we’re inflicting on the earth?

**Day 1-2**

**The Film**

Students will view and take notes on the film An Inconvenient Truth

* Depending on the class, do one of the following:
* Distribute a full outline of the film and go over main topics before the film
* Distribute the outline with just the main topics filled in—have the students fill in the rest
* Distribute the “decent attempt at an outline of the film” and have students clean it up, rearranging some points and adding others(see handout)
* Have students take notes in whatever fashion works for them (clusters, flow charts…)
* Offer extra credit to those who take notes, give it after the film, then distribute the full or partial outlines to all and discuss.

**Day 3-4**

**The Gore Gallery –**A Cooperative Learning Activity

* Divide class into groups of 3-5. Students will brainstorm ideas inspired by the film and beyond, for use in their Call to Action.

 Place poster paper throughout the room on the walls or on tables.

 Provide a marker for each group.

 Label each poster with the following Station labels. If desired start the brainstorm off with some of the ideas listed below:

Station 1 -- **Dangers**

* *Greenhouse gases*
* *CO2=hot planet*
* *Hot planet=melting glaciers*
* *Melting glaciers=40% of the earth’s populations will lose drinking water*

Station 2 -- **Opposing Views to the climate change crisis**

Station 3 -- **Opportunities: what ideas are out there to reverse the effects of climate change?**

* *Chevy Volt out in 2010*
* *Carbon capture plants*
* *Green buildings*
* *Solar…*
* *Branson’s $25,000,000 contest*

Station 4 -- **Opportunities: What ideas should be out there to improve the environment?** **Possible solutions in**

* + - * + *Scientific arena*
				+ *Business arena*
				+ *Political arena*
				+ *Personal areas*
				+ *Governmental…*

Station 5 -- **Possible forms your call to action could take:**Essay, Video, Song, Poster, Poem …

Station 6 -- **Possible ways to share your call to action: internet, school**

* Explain the Activity

*“There are posters around the room with topics related to the film written on the top. Each group will stop at a station and brainstorm and one member of the group will write the group’s ideas on the poster paper. When time is called you will move on to the next station, read the previous group’s comments and add more from your group, repeat the process until the teacher calls an end to the activity. There are no bad ideas for the brainstorming, but there are inappropriate ones. If you aren’t sure about the “safety” of your answer, call for help. When time is called on the whole activity, return to your seats. You now have an incredible amount of brainstorming information available to you. Take some time to visit any or all of these posters with your notebook and jot down ideas. These posters will remain available to you for the next few days. You may also add ideas to these brainstorms during the next few days.”*

**Day 4-5**

**Activity—Thesis construction**

* Stress the importance of the thesis statement anytime the goal is to communicate a big idea (or any idea for that matter). The Thesis Construction Worksheet illustrates the process of constructing a thesis statement and shows how Al Gore may have constructed his thesis statement for the film and book and PowerPoint, etc.
* Stress: Once you can put your idea in words and then say why your idea is true and then deal with the opposition to your idea -- your essay (or whatever) is half written.

 See **Thesis Roundabout Worksheet**

* The worksheet takes students through 3 steps for a complete thesis statement.
* Students will then run the thesis statements by their group and have group members fill out the Thesis Feedback Form
* Once they get feedback, they may
	+ Revise the statements
	+ Pick one
* With their thesis in hand they can easily map out the rest of their Call to Action using the Skeleton, Support, Draft handout. Explain Skeleton handout—with or without distributing hardcopies.

 Students will then make a skeleton/outline/sketch for their call to action

* Next, have students verify their **purpose and audience**. They certainly have had a general idea up to this point, but now is the time to solidify both. They can do so on the Skeleton handout.

**Day 5-10**

**Support**

* Guide students through the search for support for their thesis. Refer to the Gore Gallery, the film, the book, the outline, notes, and if students need more data, provide internet guidance, library help, etc

*Once you have a thesis you will need back up and support*

*Use data from An Inconvenient Truth or any other reputable, teacher-approved source. Take note of Al Gore’s support for his thesis*

* *He cites scientific research (hypothesis and results)*
* *He gives examples*
* *He gives details*
* *And he uses personal experiences to back up his thesis*

See handouts

* Continue the writing process with drafting, peer review, revision, and editing.

**Day 6-7**

**What packaging?**

Once students have a thesis and support the decision as to what form their call to action will take is the next step Whatever the form, the thesis and skeleton and support paragraphs must accompany the final product.

* A letter to the editor, the president, congress, state officials or city officials
* A personal experience narrative
* A persuasive essay
* An expository essay
* A movie
* A research report

**Day 12-14**

**Publication**

* Brainstorm more ways to get these great Calls to Action out and add the ideas to the Wallpaper poster.
* Have students submit a proposal for the presentation of their call to action to the public.
* Prepare for student feedback that screams of feelings of accomplishment, optimism in the future, and empowerment.

*We’re going to take a look at the problem of climate change with the help of Nobel prize winner Al Gore. He has been concerned about climate change for years. After a long political career ending in the 2000 loss to George Bush he devoted all his energies to these eco-concerns culminating in the Academy Award winning film, An Inconvenient Truth.*

*His call to action helped him win the Nobel and has helped jump start the ecological movement in the United States and beyond.*

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*After studying his structure and content, you will develop your own thesis statement for your Climate Change Call to Action.*

*Climate Change: A Call to Action*

Begin your Call to Action

**Thesis Construction**

The thesis is **the** most important part of any piece of communication you will ever create, no matter what form it takes. An Inconvenient Truth is as effective as it is because the thesis is strong. You can see the possible genesis of Al Gore’s thesis as you compose your first possible thesis statement below.

 Especially if your purpose is to persuade, you need three parts to the thesis:

* + 1. first is your point or the **thesis**—what is it you want to prove?
		2. second is the **synthesis**—why is your point true?
		3. third is the **antithesis** addressing the opposing view to your point.

Step #1—Start with your main point—what it is you want to prove or persuade readers to do\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Gore’s thesis—we must act now to reverse the effects of climate change**

#2 Synthesis--Why is your thesis true? Give several reasons. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Gore’s synthesis—because the crisis is real and accelerating**

#3 Antithesis

Then look for the opposition to what you’re saying. Who would argue with your point? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Gore’s antithesis—** Even though it will mean major changes in the way we behave and is an inconvenient truth

**Gore’s full thesis**: Even though it will mean major changes in the way we behave and is an inconvenient truth **we must act now to reverse the effects of climate change because the crisis is real and accelerating**

Complete two more thesis statements on the blanks below.

**Thesis Roundabout**

After you have completed three working thesis statements, get in your group and send this paper out to the other members of your group for their comments, just as you will do with their worksheet.

 Feedback checklist:

* + - Is the thesis too mundane or too big?
		- Are there enough reasons or logical reasons why the thesis is true in the synthesis?
		- Is the antithesis attuned to the rest of the statement? Is it truly addressing the opposition to the thesis?

**Your full thesis #1:**

Feedback#1

Feedback#2

Feedback#3

**Your possible thesis #2:**

Thesis\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Synthesis\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Antithesis\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Full thesis Although\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_because\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Feedback#1

Feedback#2

Feedback#3

**Your possible thesis #3:**

Thesis\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Synthesis\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Antithesis\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Full thesis Although\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_because\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Feedback#1\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Feedback#2\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Feedback#3\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Climate Change: A Call to Action*

Skeleton, Support, Draft

With a full thesis it’s pretty easy to map out where you need to go with your call to action.

* If you want to think in terms of paragraphs (you don’t **have** to and you certainly don’t have to stop at five) leave yourself one to discuss the antithesis, one for one of the synthesis points and one for another synthesis point.
* The main thing to remember in any important communication is -- your thesis statement. If you get stuck, go back to your thesis to focus on your point. If you’re going on and on, go back to your thesis and be sure you’re staying focused on it and not just blathering.

Using the thesis you’ve just written, map out a skeleton for your essay

Paragraph 1-- Introduction (a question, quote, startling fact or opinion, or a narrative). Insert the entire thesis statement after the intro.

↓

Paragraph 2--Antithesis—take care of the opposition—nicely

↓

Paragraph 3—Synthesis point

↓

Paragraph 4—Synthesis point

↓

Paragraph 5—Conclusion (Restate thesis and end with a bang)

**Support**

*Once you have this skeleton, it’s time to flesh it out (eek!).*

*You will need back up and support*

*Use data from An Inconvenient Truth or any other reputable, teacher-approved source. Take note of Al Gore’s support for his thesis*

* *He cites scientific research (hypothesis and results)*
* *He gives examples*
* *He gives details*
* *And he uses personal experiences to back up his thesis*

**Appendix 3: College Course Syllabus on Climate Change**

**Don’t know where I found this, but it’s got some good links**

Course Syllabus

What is Global Climate change and what is causing it?

• The green house effect and the gases that trap heat

 Readings: <http://en.wikipedia.org/wiki/Greenhouse_gas>

 NASA Earth Observatory- Introduction to greenhouse effect and climate change.

 <http://earthobservatory.nasa.gov/Features/GlobalWarming/global_warming_update2.php>

• Build up of green houses gases from 650,000 years ago to the present

Vostok Ice Core data – how C02 data is collected and climate patterns obtained from the data.

<http://cdiac.ornl.gov/trends/co2/vostok.html>

Melankovitch cycle.

<http://www.homepage.montana.edu/~geol445/hyperglac/time1/milankov.htm>

• How do we know that Greenhouse Gases are the cause of the warming the planet has experienced since 1990

Four major international climate modeling centers that determined greenhouse gases as the cause of warming

<http://www.grida.no/publications/other/ipcc_tar/?src=/climate/ipcc_tar/wg1/figspm-4.htm>

Average Temperature worldwide increase of .4 to 0.8 degrees C globally has occurred. A review of the Impacts of that warming on bioregions.

 • The Arctic - Polar Ice Cap

National Snow and Ice Center website

State of the Cryosphere Arctic and Antarctic - <http://nsidc.org/sotc/sea_ice.html>

• Tipping points

[http://www.time.com/time/health/article/0,8599,1920168,00.html#ixzz0bDpx9XNE](http://www.time.com/time/health/article/0%2C8599%2C1920168%2C00.html#ixzz0bDpx9XNE)

Agriculture Tipping points. Climate change tipping point defined for crop yields

[www.newscientist.com/.../dn17680-climate-tipping-point-defined-for-us-crop-yields.html](http://www.newscientist.com/.../dn17680-climate-tipping-point-defined-for-us-crop-yields.html)

• The Arctic - Changes in Greenland

University Corporation for Atmospheric Research News release. <http://www.ucar.edu/news/releases/2009/sealevel.jsp>

Greenland Ice melt accelerates.

<http://www.scientificblogging.com/news_articles/greenland_ice_cap_melting_hurry_study_suggests>

• Permafrost melt (climate progress)

Scientists discuss and analyze Arctic melt and permafrost melt

<http://climateprogress.org/2008/06/12/breaking-news-tundra-4-permafrost-loss-linked-to-arctic-sea-ice-loss/>

 **Sea Level Rise**

Causes of Sea Level Rise

<http://earthobservatory.nasa.gov/IOTD/view.php?id=6638>

Sea Level rise -review of several scientific reports

<http://news.bbc.co.uk/2/hi/8387137.stm>

Grace Satellite finds Eastern Antarctic (once thought to be safe from melt ) is beginning to melt and discusses the difficult task of defining ice melt.

<http://climateprogress.org/2009/11/23/satellite-data-grace-east-antarctica-ice-sheet-losing-mass/>

**Impacts of Sea Level Rise**

Populations of low elevations island facing inundation

<http://tinyurl.com/ycq6gfa>

low elevation islands in peril - a collection of sites documenting sea level rise issues for various island nations.

<http://tinyurl.com/2vwsy6>

**Melting Mountain Glaciers and possible fresh water supply issues**

 Loss of Himalayan glaciers.

 Gangotri glacier loss that feeds the Ganges River India

<http://earthobservatory.nasa.gov/IOTD/view.php?id=4594>

Gangotri glacier and the Ganges river.

<http://www.the-south-asian.com/Aug2004/Gangotri_glacier.htm>

**Loss of Andes Glaciers and its implications**

Bolivia's Chacaltaya Glacier Melts away 6 Years Early

<http://solveclimate.com/blog/20090506/bolivias-chacaltaya-glacier-melts-nothing-6-years-early>

**Ocean Acidity -**

C02 and our ocean legacy

<http://www.pmel.noaa.gov/pubs/PDF/feel2899/feel2899.pdf>

impacts of acidity

[http://www.tgdaily.com/general-sciences-features/44891-acid-oceans-can- trigger-thicker-shells](http://www.tgdaily.com/general-sciences-features/44891-acid-oceans-can-trigger-thicker-shells)

**Climate impacts on Coral reefs - Coral Bleaching**

Warming waters and its effects on coral reefs

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

Coral bleaching on Great Barrier Reef

http://news.mongabay.com/2005/1117-corals.html

**Climate change impacts on forests**

Alaskan and Canadian Boreal forests

Canadian Forestry Dept. report loss of forest as a C02 sink. <http://minnesotansforglobalwarming.com/m4gw/2009/01/canadas-forests-causing-global-warming.html>

US forest service Regional Bark Beetle information

<http://www.fs.fed.us/r2/bark-beetle/>

Forest losses in western states.

 <http://tinyurl.com/ye9nbb>9

Tropical Rain forests Impacts of Climate change

Two scenarios for the Brazilian Rain forest.

<http://news.mongabay.com/2009/0211-amazon.html>

**Wildfires**

Warming and earlier Spring Increase Western U.S. Forest Wildfire Activity

<http://www.sciencemag.org/cgi/content/full/313/5789/940>

**More extreme Droughts- Climate impacts on subtropical and desert regions**

Fleeing drought in the horn of Africa

[http://www.latimes.com/news/nationworld/world/la-fg-climate-refugees25-2009oct25,0,4396751.story](http://www.latimes.com/news/nationworld/world/la-fg-climate-refugees25-2009oct25%2C0%2C4396751.story)

Drought in Australia

Australian drought worsens

<http://e360.yale.edu/content/feature.msp?id=2137>

Koala bears population decline

<http://www.thesun.co.uk/sol/homepage/news/2724499/Koalas-extinct-in-30-years.html?OTC-RSS&ATTR=News>

**United Nations Copenhagen Climate Change conference**

Summary of the meeting highlights and midway in the document a brief of the accord from that conference.

<http://www.pewclimate.org/international/copenhagen-climate-summit-summary>

**Common misconceptions and arguments against climate change – Realities vrs misconceptions.**

<http://www.pewclimate.org/science-impacts/realities-vs-misconceptions>

**Sources and outlook for supply of Oil**

Peak Oil Crude Oil the Supply outlook. Energy Watch Group 2008

 [www.energywatchgroup.org/.../2008-02\_EWG\_Oil\_Report\_updated.pdf](http://www.energywatchgroup.org/.../2008-02_EWG_Oil_Report_updated.pdf)

**Tar sand mining and oil extraction in Canada**

[**http://ostseis.anl.gov/guide/tarsands/index.cfm**](http://ostseis.anl.gov/guide/tarsands/index.cfm)

**Coal mining in the US**

Mountain top mining in Appalachia

[**http://www.appvoices.org/index.php?/site/mtr\_overview/**](http://www.appvoices.org/index.php?/site/mtr_overview/)

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[**http://www.wma-minelife.com/coal/coalhome.html**](http://www.wma-minelife.com/coal/coalhome.html)

**Increasing demand for energy - World and US population growth**

**World population discussion and data sheets**

[**http://www.prb.org/Publications/Datasheets/2009**](http://www.prb.org/Publications/Datasheets/2009)

**US population growth**

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**Alternative energy Source – potential and already operational**

**Solar thermal energy - Solar tower in Spain.**

[**http://www.treehugger.com/files/2009/04/worlds-largest-solar-power-tower-spain.php**](http://www.treehugger.com/files/2009/04/worlds-largest-solar-power-tower-spain.php)

**Solar thermal in the US**

[**http://en.wikipedia.org/wiki/Solar\_Energy\_Generating\_Systems**](http://en.wikipedia.org/wiki/Solar_Energy_Generating_Systems)

**Algae biofuels**

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 **Wave energy**

[**http://eecs.oregonstate.edu/wesrf/**](http://eecs.oregonstate.edu/wesrf/)

**Reoccurring regional climate fluctuations that can mask or strengthen climate**

**change impacts.**

**Arctic Oscillation - 2008 and 2009 harsh winters explained.**

[**http://earthobservatory.nasa.gov/IOTD/view.php?id=42260**](http://earthobservatory.nasa.gov/IOTD/view.php?id=42260)

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**Pacific Decadal Oscillation PDO**

[**http://jisao.washington.edu/pdo/**](http://jisao.washington.edu/pdo/) **AMO**

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[**http://wwwpaztcn.wr.usgs.gov/.../articles/200404.html**](http://wwwpaztcn.wr.usgs.gov/.../articles/200404.html)

**Conservation measures**

**Tax Credits from Federal, State and Utility companies for energy conservation.**

**State of Oregon** [**http://www.oregon.gov/ENERGY/CONS/RES/reshome.shtml**](http://www.oregon.gov/ENERGY/CONS/RES/reshome.shtml)

**Federal Tax Credits for home improvements**

[**http://www.energystar.gov/index.cfm?c=tax\_credits.tx\_index**](http://www.energystar.gov/index.cfm?c=tax_credits.tx_index)

Federal Energy Star program.

<http://www.energystar.gov/>