



REACHING NEVADA'S TEACHERS THROUGH NSF EPSCOR CLIMATE CHANGE SCIENCE INSTITUTES

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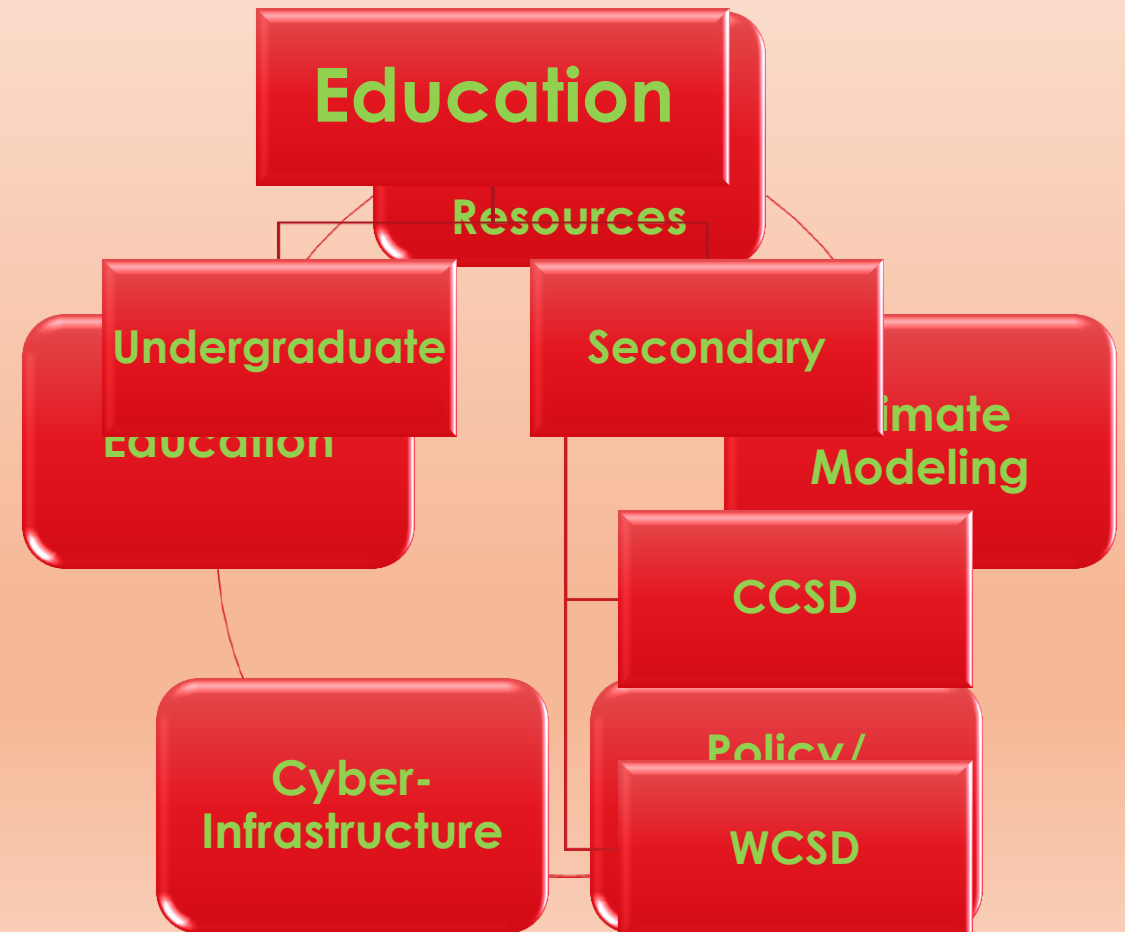
PROJECT BACKGROUND

- NSF EPSCoR awarded NSHE a \$15 mill/5 year grant for climate change science



<http://epscorspo.nevada.edu/nsf/climate1/>

- Main components



EDUCATION COMPONENT GOALS

- Increase the number and quality of STEM educators and STEM professionals in the region and country
- Develop institutional partnerships that support exemplary practices and policies in STEM education
- Implement inquiry activities focusing on facets of climate change science and promote interest in STEM career pathways and higher education

SUMMER INSTITUTES

- Two week summer sessions, 7 positions, 3 grad credits (GEOG 691), ended in December
- Rotating curriculum:



- 19 secondary teacher participants from CCSD over the course of the program

HIGH SCHOOLS

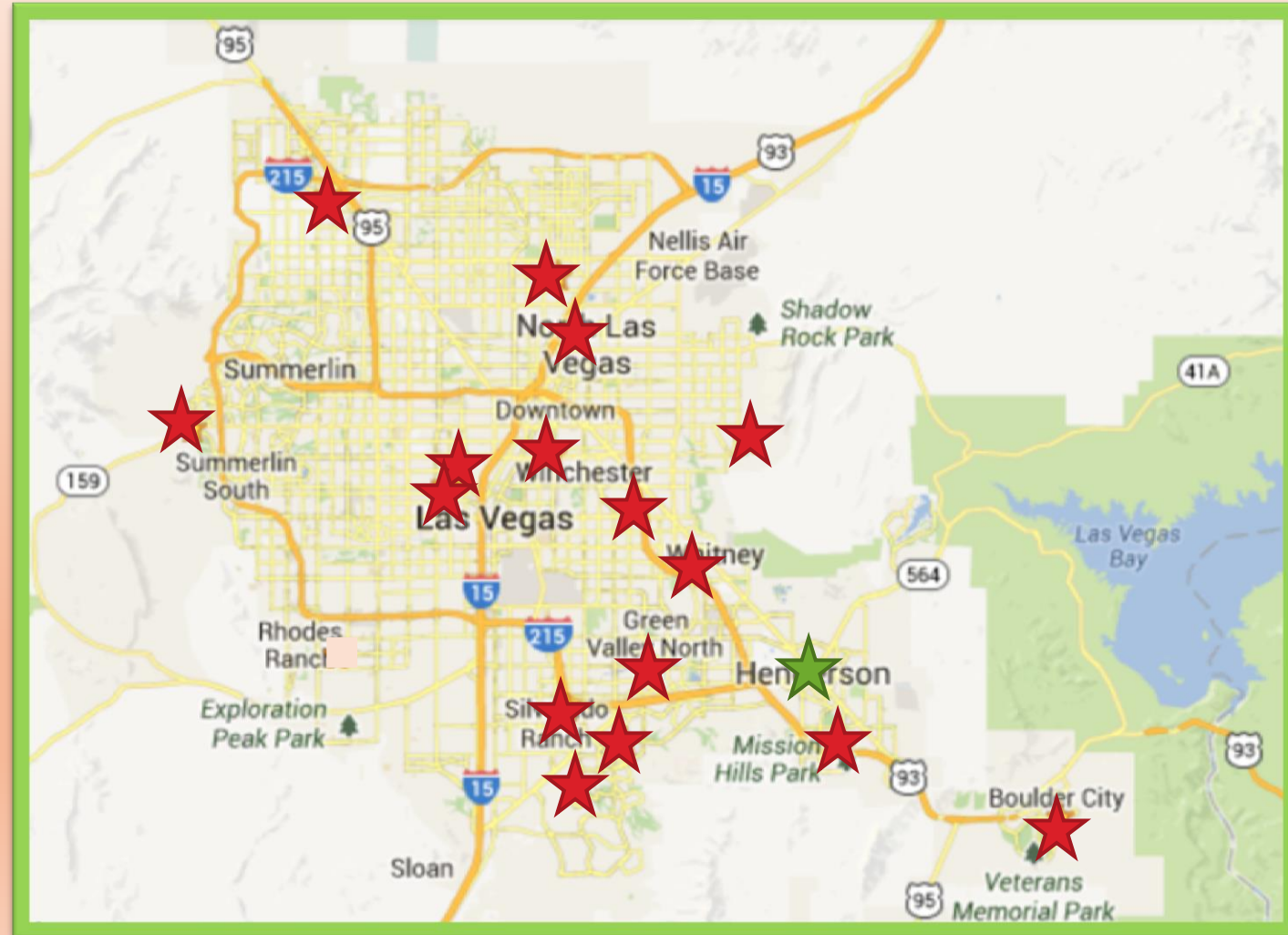
- West Career & Technical Academy
- Northwest Career & Technical Academy
- Canyon Springs H.S.
- Chaparral H.S.
- Coronado H.S.
- Silverado H.S.

- Foothills H.S.
- Clark H.S.

MIDDLE SCHOOLS

- Coral Academy of Science
- Jim Bridger M.S.
- Bob Miller M.S.
- Cashman M.S.
- Courtney M.S.
- Harney M.S.
- Fremont M.S.
- Garrett M.S.

CCSD SCHOOLS INVOLVED



S.I. PROGRAMMING

- In-Class
 - Content lectures
 - Reading topics
 - Discussions
 - Researcher presentations
 - Inquiry activities



- Out of Class
 - Laboratory visits
 - Researcher presentations
 - Field trips



OUT OF CLASS ACTIVITIES



S.I. OUTPUT

- Inquiry activities focusing on different facets of cc science
- Standards based
- Each teacher develops their lesson throughout the institute and the last day is devoted to working through each lesson.

LESSONS & NEVADA SCIENCE STANDS.

WEATHER/CLIMATE

N.8.A E.8.A
N.12.A E.12.A

- Moving day: How does climate affect plant and animal distribution
- Measuring the Urban Heat Island Effect
- Modeling carbon consumption and GHG Emissions
- Temperature effects on CO_2 solubility in oceans
- Density of liquids to understand the Thermohaline circulation
- Climographs of Nevada
- Climate in your community



LESSONS & NEVADA SCIENCE STANDS.

PALEOCLIMATE

N.8.A E.8.C
N.12.A E.12.C

- Leaf margins as climate indicators: Past and Present
- Packrat Middens: Evidence for climate change in the fossil record
- Stable isotopes as proxies for paleoclimate
- Tracking and graphing CO₂ through time
- Fossil Hunters: Adventures in paleoecology
- Secrets of the sediments



LESSONS & NEVADA SCIENCE STANDS.

EARTH DYNAMICS

N.8.A E.8.C
N.12.A E.12.C

- Plate tectonics and its relation to climate change
- Natural disasters: Volcanoes effecting climate
- Volcanoes changing global climate



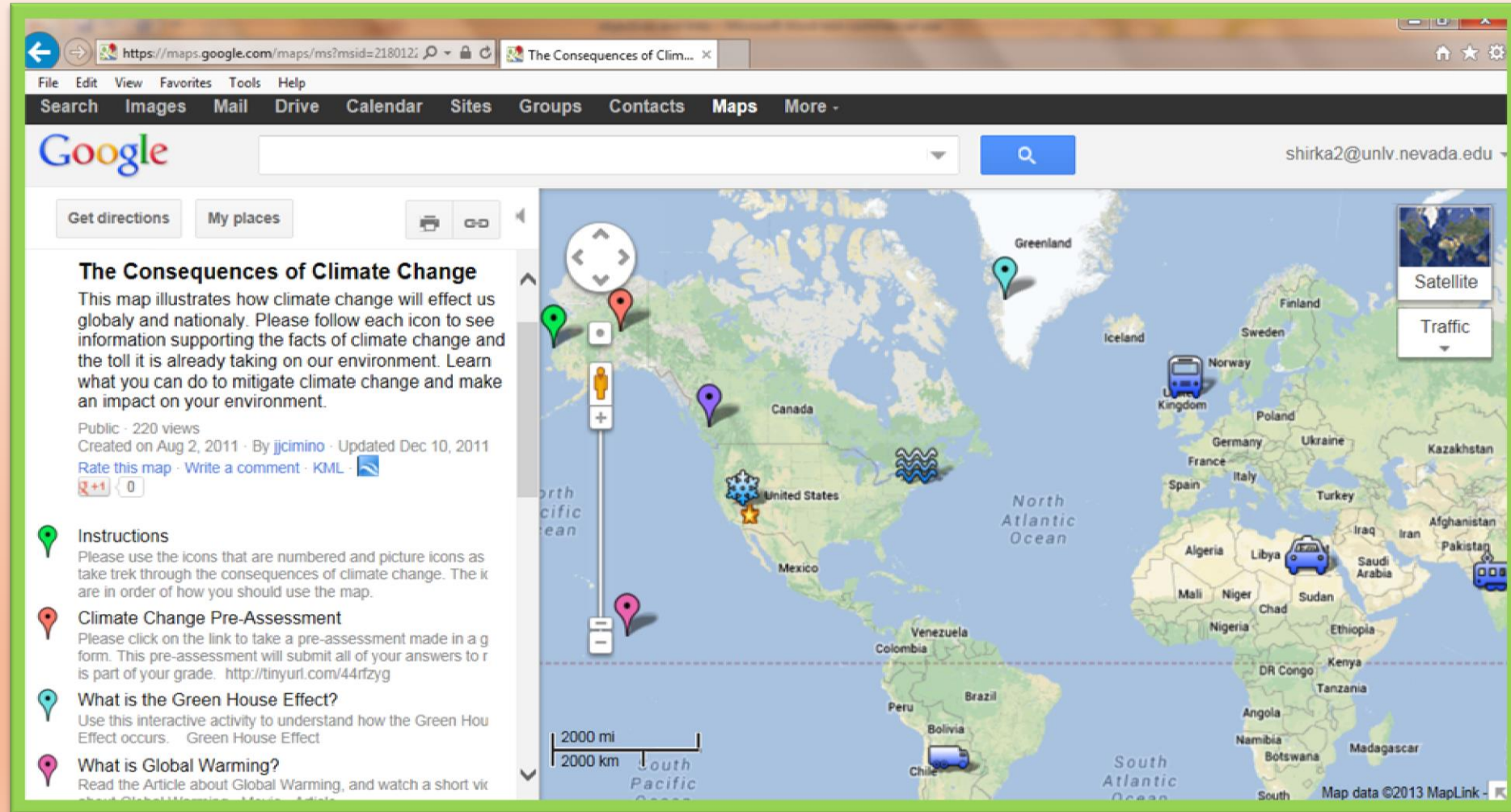
LESSONS & NEVADA SCIENCE STANDS.

SUSTAINABILITY

N.8.A E.8.C.7

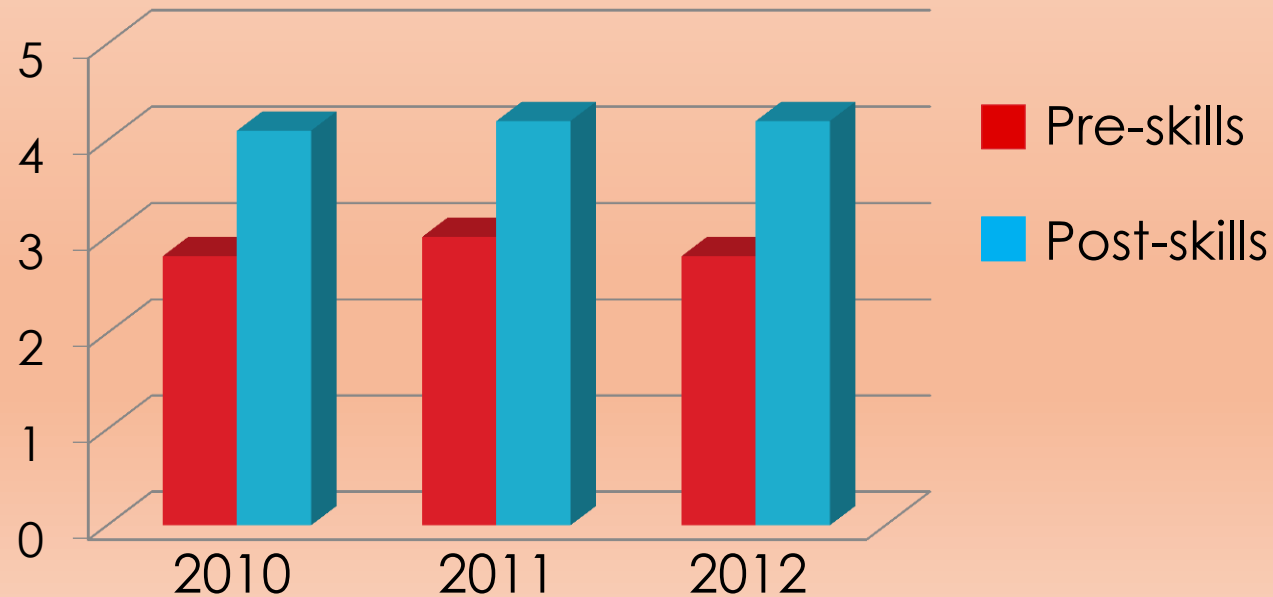
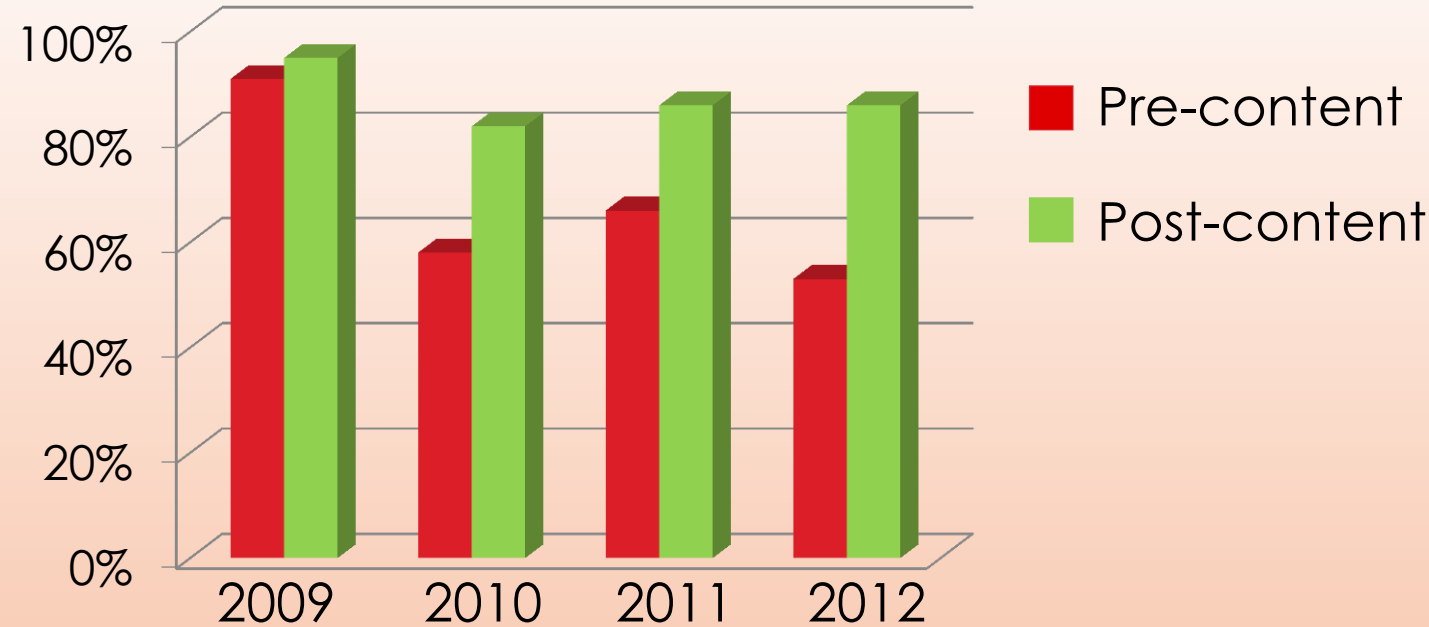
N.12.A E.12.C.4

- Calculating your carbon footprint: embracing “going-green”
- Creative writing and climate change: Be proactive
- Using google earth to understand cc mitigation
- Understanding causes of GHGs



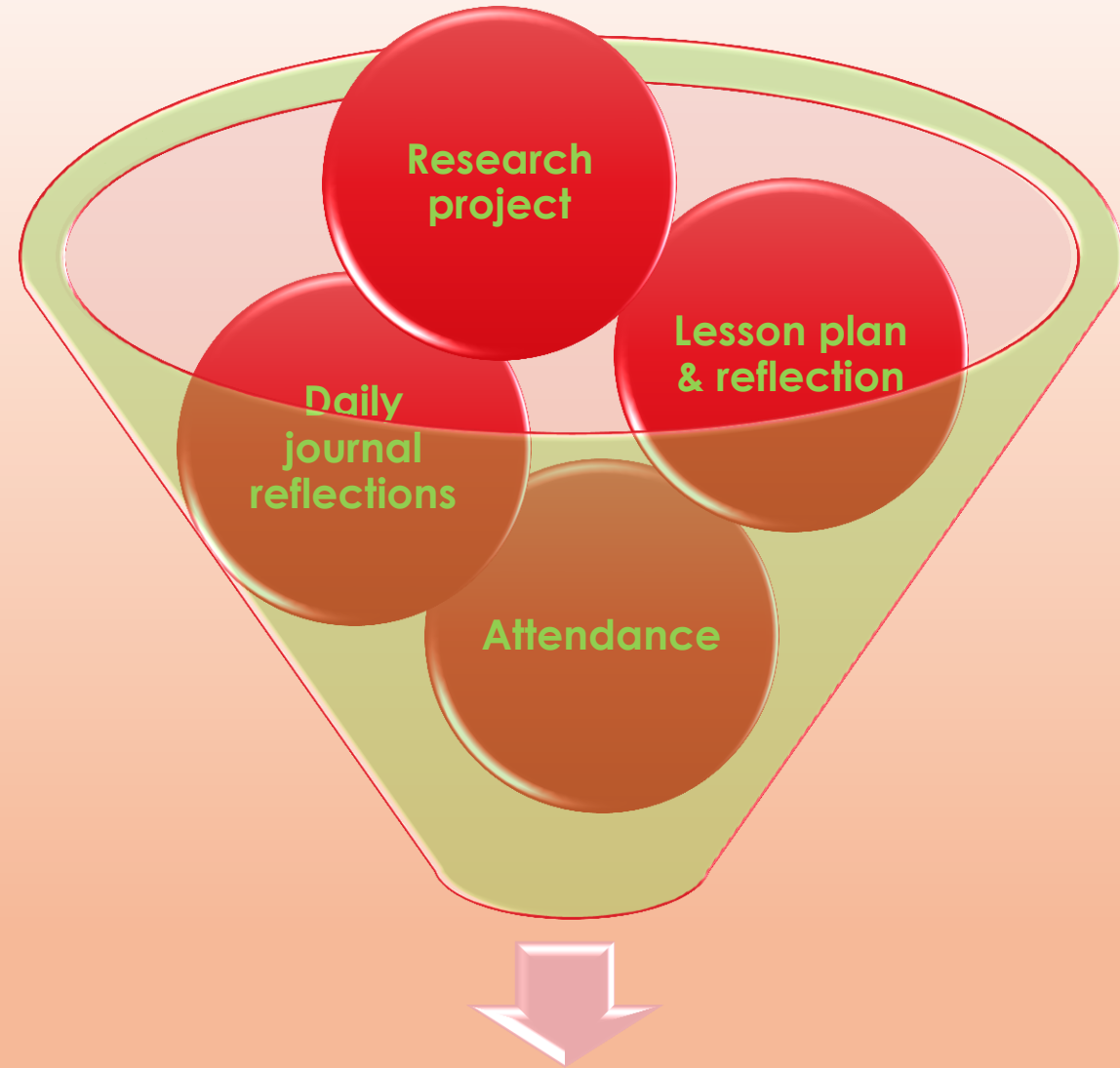
INSTITUTE ASSESSMENTS

- Institution (informal)
 - Pre-post tests
 - Content
 - Skills and Knowledge
- Week 1 survey
- Informal feedback
 - Course subjects covered
 - Participants and activities



TEACHER ASSESSMENTS

- Several components to constitute grades
- Two post-institute meetings
- Final grade issued in the fall after the summer institute



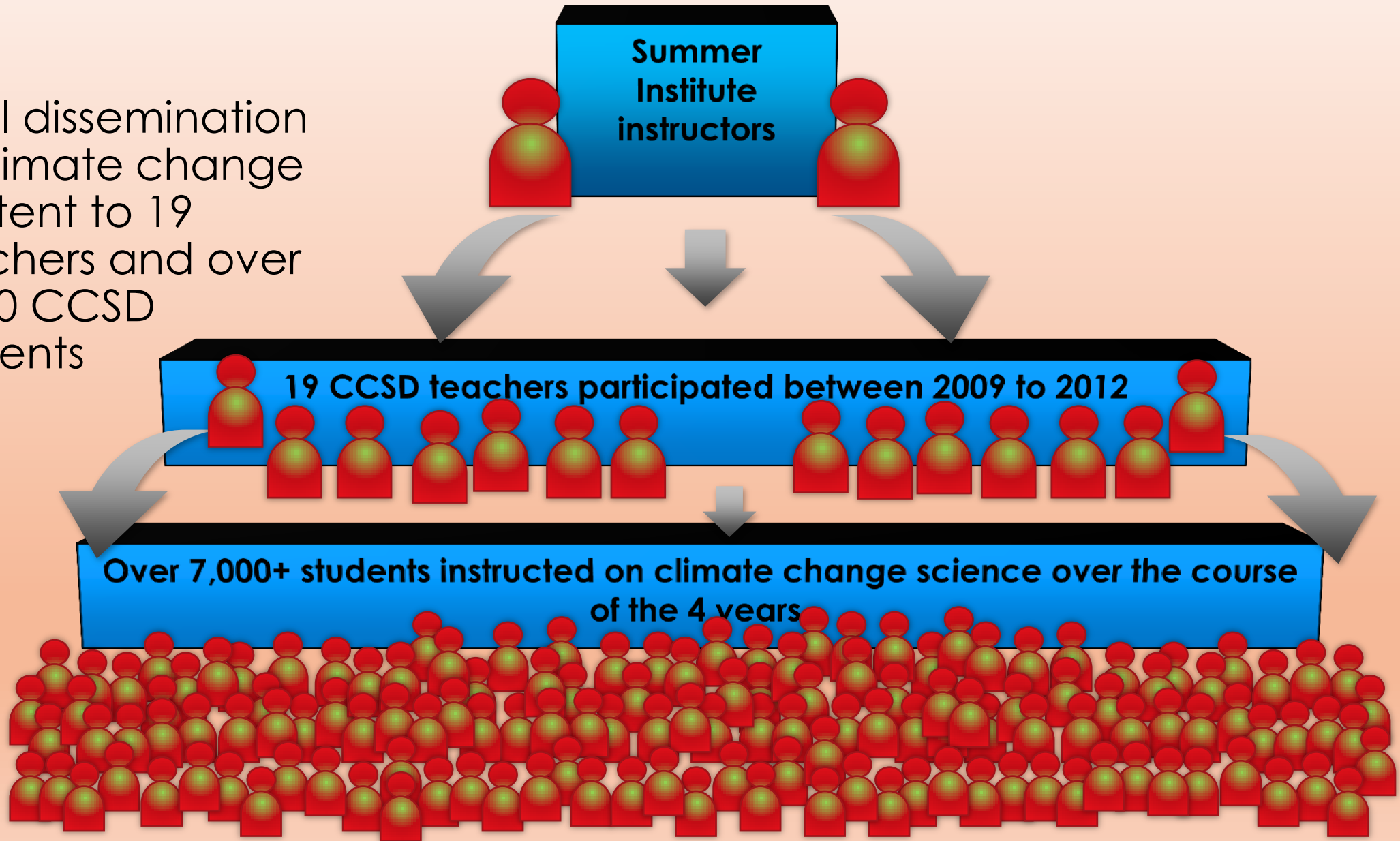
Final Grade

PROGRAM ACCOMPLISHMENTS

- Developed inquiry lessons, available on the data portal and <https://sites.google.com/site/geog691/>
- Significant increase in the cc comprehension level of participants, and their confidence level for leading field trips and investigating local climate change impacts.
- Inquiry-based lessons produce higher level of interest in climate change topics. Student assessments → students performed well on climate change activities and remembered content longer.
- Teacher evaluation of the summer institute class has been extremely favorable
 - 4.5/5 three-year average rating of summer institute quality.

PROGRAM ACCOMPLISHMENTS

- Total dissemination of climate change content to 19 teachers and over 7,000 CCSD students



ACKNOWLEDGEMENTS

- NSF
- Nevada EPSCoR
- Education Component organizers
- CCSD teachers and students