**“What’s Invasive”: STEM and *The Grapes of Wrath***

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9th Grade Honors ELA

**Background**

In order to engage students enrolled in the STEM (Science Technology Engineering and Math) program at CVA, *The Grapes of Wrath* unit of Honors 9 ELA will include a more scientific approach in which the first two levels of Edward Ricketts/John Steinbeck’s methods of observation will be incorporated. This will be accomplished through close coordination with the Ecology teacher and the 9th grade Honors ELA teacher. A springtime field trip to make observations and to collect samples will be a part of this unit, so a requisition for the field trip must be made prior to the start of school.

**Objective**

To enhance the students’ abilities to make better observations both within the texts and in the field, to make meaningful connections between two subject areas and their methodologies, to build a sense of place within each student, and to foster descriptive writing skills across the curriculum. Students will apply the first two levels/approaches of Steinbeck/Ricketts’ observation methods to *The Grapes of Wrath,* selected essays, poetry, and species in the lab and field. A focus on the invasive qualities of both species and migrants will be key to this unit. All aspects of STEM will be addressed through the merging of ecology, statistics, apps for GPS and invasive species identification, and mapping of the observation sites within an ELA unit.

**Materials**

*The Grapes of Wrath* by John Steinbeck – student issued copies

*On Reading the Grapes Wrath* by Susan Shillinglaw Ch. 2 (reading on Google Classroom)

“Thinking Like a Mountain” by Aldo Leopold

*Silent Spring* by Rachel Carson (excerpt in *Literature* textbook pp. )

“Fire on the Hills,” “Ascent to the Sierras,” and “Tor House” by Robinson Jeffers

“What’s Invasive!” Scientific American citizen science project with app located at <http://www.scientificamerican.com/citizen-science/whats-invasive/>

Yonder or Ramblr app for GPS mapping

iPads or cellphones for cameras, calculators, and apps

Eye droppers, vials, and plastic bags for plankton collection

Microscopes and petri dishes

Student notebooks

Hula hoops to serve as observation grids

Transportation to designated lake, swamp, and canal

**Procedure**

1. The ELA and Ecology teachers will jointly introduce students to this unit. The Ecology teacher will cover scientific essays with students and cover the approaches to Ecology observation with them. Meanwhile, the ELA teacher will introduce the students to Ch. 2 of *On Reading the Grapes of Wrath* and discuss Steinbeck’s levels prior to beginning *The Grapes of Wrath.*
2. Students will read *The Grapes of Wrath* with a focus on the levels, descriptive language, and sense of place. This will be enhanced through discussion, use of Jeffers’ poetry, short student written responses, and blogs.
3. A spring field trip will be arranged for late April/early May to take students to three types of water bodies for observations and plankton collection. In the week prior to this trip, the Ecology teacher will introduce the students to the “What’s Invasive” citizen science project at Scientific American and show them how to use the app on iPads or cellphones. The ecology teacher will also instruct the students on how to set up an observation grid with a hula hoop, GPS the position by using an app on an iPad or cellphone, and demonstrate how to collect plankton samples from the predetermined locations. Ricketts’ first two levels of observation will be reviewed. The ELA teacher will instruct the students in the areas of notetaking, photography requirements, drawing, and journal guidelines. They will also review Steinbeck’s levels.
4. Students will visit three types of water bodies: a lake, a swamp, and a canal in one day. At each location, all students will set up grids for observation using hula hoops for uniformity. Using iPads or cellphones, students will enter their locations into a GPS app at each location. Students will then observe each location for 10 minutes in a low and still position. They will identify a specific species during this time. Students will record their observations using specific terms and draw the species in their notebooks. Students will then observe the grid a second time with a focus on the community of the grid. After recording these observations and mapping the community in their journals, students will photograph the grid and any species found within it. They will then use the “What’s Invasive” app. Finally, working in pairs, the students will take plankton samples from each location and mark them appropriately.
5. The day after the field trip, students will examine the plankton samples in the Ecology lab under microscopes. They will draw or photograph their findings, identify them,
6. and report them via the “What’s Invasive” app. Additionally, they will record these finding in their journal notes. It is expected that they will find larval species that they could not see without the microscopes in the field settings.
7. In the ELA classroom, students will respond to the following writing prompt: Why are the Joads and other Okies treated like invasive species by the residents of California in *The Grapes of Wrath* and was this attitude wrong? Explain.
8. Using the notes and other materials from the field observations, students will write personal journal entries of 1,000 words in which they use the pronoun “I,” descriptive language, and a focus on the world as the audience for this writing. These entries will include photographs, GPS locations, statistics on invasive species, and the date of field trip in a cover sheet. Students will be asked to present their journal entries in a public forum.

**Common Core Standards**

Reading: Literature Reading: For Information

ELA.Literacy-RL.9-10.1 ELA.Literacy-RI.9-10.2

ELA.Literacy-RL.9-10.2 ELA.Literacy-RI.9-10.3

ELA.Literacy-RL.9-10.3 ELA.Literacy-RI.9-10.4

ELA.Literacy-RL.9-10.4 ELA.Literacy-RI.9-10.6

ELA.Literacy-RL.9-10.5 ELA.Literacy-RI.9-10.9

ELA.Literacy-RL.9-10.7 ELA.Literacy-RI.9-10.10

Writing: Speaking & Listening:

ELA.Literacy-WHST.9-10.2 ELA.Literacy-SL.9-10.1

ELA.Literacy-WHST.9-10.4 ELA.Literacy-SL.9-10.2

ELA.Literacy-WHST.9-10.5 ELA.Literacy-SL.9-10.4

ELA.Literacy-WHST.9-10.6 ELA.Literacy-SL.9-10.5

ELA.Literacy-WHST.9-10.10 ELA.Literacy-SL.9-10.6