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7th grade Science
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Slowing Climate Change: Write an Argument.

0. Abstract

Climate change will affect ecosystems. Unless we want these drastic changes to occur, we must make changes in our lives. My students will use their understanding of greenhouse gas mechanisms, alternative fuels, and chemical reactions -- specifically combustion of hydrocarbons -- to write an argument to defend their claim about how we can slow climate change.

I. Standards/Skills/Objectives/Assessment

1. Focal Standard or Skill: NGSS MS-LS2-4:

Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

2. Measurable Objective(s):

Students will write an argument (using the WISE website) to their congressperson that defends their claim about how we can slow global warming.

3. Assessment:

The teacher will use a WISE rubric to evaluate the quality of students' arguments.

II. Fellowship Connections

1. 21st Century Skill:

Interpret information and draw conclusions based on the best analysis

2. 21st Century Skill Application:

These skills will be practiced as students gather information and evidence from the WISE activity. Students will be asked to compare cost and greenhouse gas output to determine the best recommendation for slowing climate change.

3. Fellowship Description:

The WISE (Web-based Inquiry Science Environment) research group supports the development of its website and of the teachers who use the website. As stated on their website, “Web-based Inquiry Science Environment is a research-based digital learning platform that fosters exploration and science inquiry. Students, observe, analyze, experiment, and reflect...” (Web-based Science Inquiry Environment, 2016). During my fellowship I have helped them analyze student data to help improve the curriculum and assessment design. I have used Google docs extensively and been exposed to the programming that underlies machine learning.

4. Fellowship Connection to School/Classroom:

My fellowship connects to my school, specifically my science teaching, colleagues, and students. For my colleagues, I will introduce them to the large depth of content and inquiry available through the WISE website. For my students, WISE will give them an additional format to learn science, in addition to hands-on which is FOSS's strong suit.

WISE has 22 projects geared toward middle school students, including chemistry, photosynthesis, thermodynamics, climate change, plate tectonics, genetics, and graphing. The site is geared for teacher use. For example, WISE has an alert system to tell teachers which students are scoring exceptionally low (and may have questions) or exceptionally high (and can possibly assist other students), which students are moving slowly (and are possibly confused) or quickly (and perhaps missing content). Also, WISE has automated guidance for some of the questions (the website automatically scores some student responses) which frees teachers to help more students. These are features unavailable on the FOSS website.

I think my students will be excited to learn that they are part of a research project, that the WISE research team will be looking at the work they do. This will add to their letters to make their part of WISE more real, not just a classroom project.

III. Instruction

1. Instructional Plan:

Letter to Congressperson Partner Edit
Shelley Grant

Plan of Activity: 59 min class

Overview:

The students have been working with the WISE (Web-based Inquiry Science Environment) website to apply their knowledge of chemistry to a real life problem: climate change. The website is a “research-based digital learning platform that fosters exploration and science inquiry. Students, observe, analyze, experiment, and reflect.” Student have been learning about the causes of climate change and possible solutions. The summative assessment is a letter to their congressperson arguing for a solution. In this activity, first the students use a graphic organizer to prepare to write their letter. Second they explain their argument to their partner. Students are accountable for their pre write and a description of their partner’s argument.

Classroom Context:

We have been working on writing arguments since the beginning of the year. We started with simple arguments using simple claims, evidence, and reasoning (CER) and have used the same graphic organizer and vocabulary.

This argument is more complicated than previous ones. It involves scientific concepts: hydrocarbon combustion reactions, solar energy transformation. They will have multiple lines of evidence. To support this challenge, they will do both individual prewriting and partner discussion/editing.

This activity is the individual pre write and partner discussion/editing.

Student Practice/Content Objectives:

As a result of this lesson students will be able to:

- Describe the components of their argument (Claim, Evidence, Reasoning) in writing and orally to their partner.
- Describe, in writing, components of their partner’s argument.

Teacher Objectives:

- Review CER graphic organizer.
- Review organelle function in cells.
- Listen to student thinking in opener regarding electric cars. Are they thinking about where electricity comes from?
- During individual writing time, assess who is struggling with content.
- During partner work time, listen to arguments to identify ongoing content misconceptions.
- Assess group work with the four-point system.

Next Generation Standards Supported:

NGSS MS-LS2-4:

Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.

Materials:

- Science journals
- Chromebook, one per student.
- Google docs: CER handouts.

Assessment:

- Opener: Using sticks sample three or four student understanding of electric car energy source.
- CER pre write
- CER partner argument description.

Minutes	Description of Activity	Materials needed
5 min	Students write while teacher takes roll.	Science journals.
9 min	Opener: "One idea I have about how to power a car with NO pollution is _____."	Science journals. Student name sticks.
5 min	Chromebook checkout	Chromebook cart
20 min	CLEVR frame climate change worksheet - Google doc.	Chromebook
15 min	CLEVR frame climate change partner work - Google doc.	Chromebook
5 min	Closer: "One thing I think is important about slowing climate change is _____."	Science journals.

3. Supply List:

Supply List:

- Chromebooks, one per student
- Google docs: CLEVR frame climate change worksheet, CLEVR frame climate change partner work

4. Bibliography:

Web-based Inquiry Science Environment. (2016). Retrieved from <https://wise.berkeley.edu>

IV. Attachments

Attachments:

- [CLEVR frame climate change worksheet](#)
- [CLEVR frame climate change partner work](#)
- [CR 2016 Letter Rubric](#)