

Chapter 12



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Chrissy Garcia: Investigating Introduced Species

Chrissy Garcia is a middle school science and literacy teacher in the Chicago Public School system. Chrissy strives to provide students with engaging and enriching learning opportunities because all children deserve a quality education. Chrissy is a proud alumna of Chicago Public Schools, University of Illinois Urbana-Champaign, and the Golden Apple Scholars of Illinois program.

Investigating Introduced Species, sneak peak of Ecology Argumentative Writing Unit

Grade Level: Seventh Grade

Content Area Topic: Science and Language Arts

Content Area Standard(s):

Common Core Math Standards:

- MP.6-8.1: Make sense of problems and persevere solving them.
- MP.6-8.3: Construct viable arguments and critique the reasoning of others.
- MP.6-8.5: Use appropriate tools strategically.

Common Core Reading Standards:

- RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts.
- RST.6-8.2: Determine central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge and opinions.
- RST.6-8.7: Integrate quantitative or technical information expressed in word in a text with a version of that information expressed visually (e.g.; in a flowchart, diagram, model, graph, or table).
- RST.6-8.8: Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

Common Core Writing Standards:

- WHST.6-8.1: Write arguments focused on discipline-specific content.
- WHST.6-8.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
- WHST.6-8.5: With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or typing, a new approach, focusing on how well purpose and audience have been addressed.
- WHST.6-8.6: Use technology, including the Internet, to produce and publish writing and present the relationships between information and ideas clearly and efficiently.
- WHST.6-8.8: Gather relevant information from multiple print and

digital resources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of other while avoiding plagiarism and following a standard format of citation.

- WHST.6-8.9: Draw evidence from informational texts to support analysis and reflection, and research.

Common Core Speaking Standards:

- SL.1: Prepare for and participate effectively in a range of conversations and collaboration with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
- SL.2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
- SL.4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

Next Generation Science Standards:

- MS-LS2-1: In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction.
- MS-LS2-2: Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared.
- MS-LS2-1: Growth of organisms and population increases are limited by access to resources.
- MS-LS2-4: Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations.

Learning Objective(s):

- Obtain, evaluate, and communicate information about the consequences of introducing a species to another ecosystem
- Engage in argument from evidence to debate the advantages and disadvantages of introducing a new species to an ecosystem
- Engage in argument from evidence to debate the advantages and disadvantages of whether or not there should be laws in place to regulate exotic pet ownership

- Research relevant information from multiple print and digital resources to support claim
- Engage in conversation roundtable to build on classmates’ ideas and clearly articulate their own ideas
- Define a problem about how humans can impact an ecosystem

Suggested Time Allotment:

- 45 minutes for lesson
- Minimum of 4 weeks for the unit

Sequence in Learning:

Prior to completing this lesson, students will have begun investigating ecology. Students will have already collaboratively close read the following texts: “Exotic Pets Gone Wild: Tegu Lizard Wreaks Havoc in the Florida Everglades” and “Pet turns pest: California kingsnakes rampage across the Canary Islands” in whole group, small group, and independent practice. The texts are available from NEWSELA. Articles can be printed at five different lexile levels to support students with diverse reading levels.

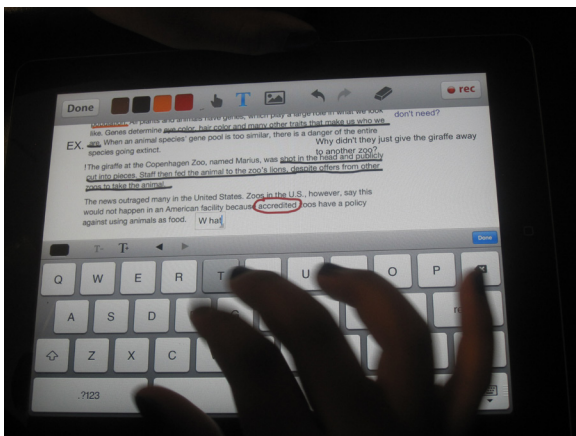


Figure 1: Students annotate using EduCreations.

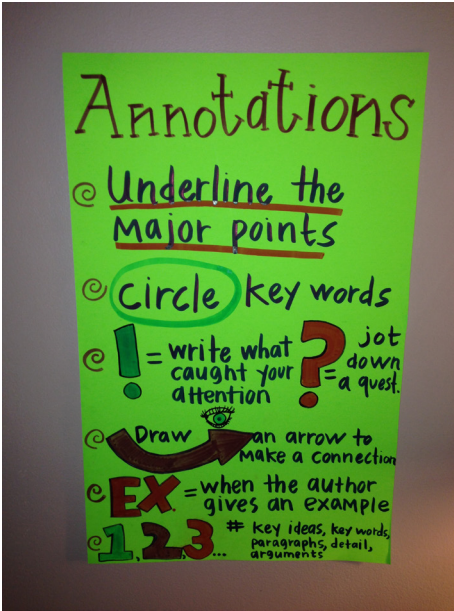


Figure 2: Annotations anchor chart.

Students will do multiple reads of the text to make connections to predator and prey relationships, food chains and food webs, limiting factors of population, ecological disruptions, human impact, and control of invasive species. The goal of the science argumentative writing unit is to engage in argument from evidence to debate the advantages and disadvantages of introducing a new species to an ecosystem and to debate whether or not there should be laws in place to regulate exotic pet ownership.

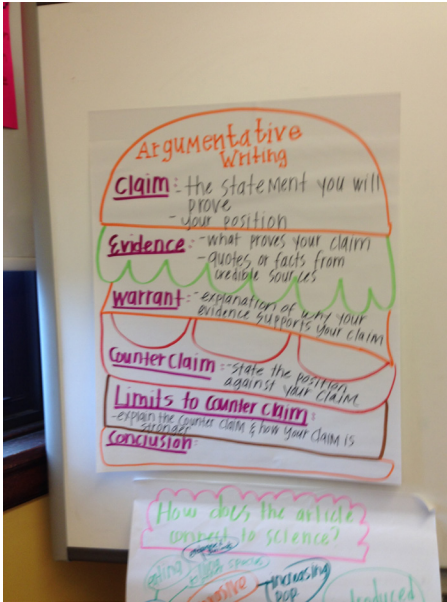


Figure 3: Steps of argumentative writing.

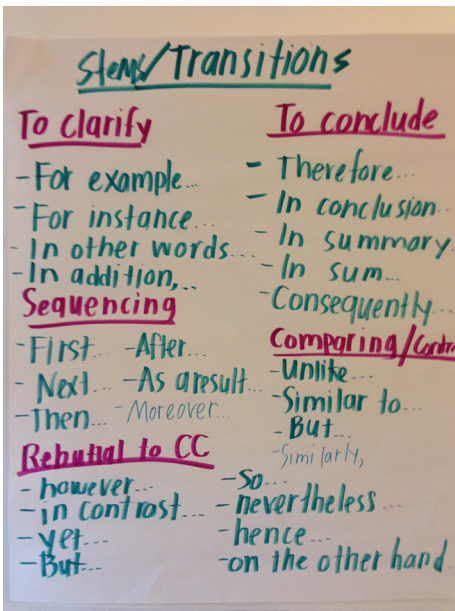


Figure 4: Sentence stems for diverse learners.

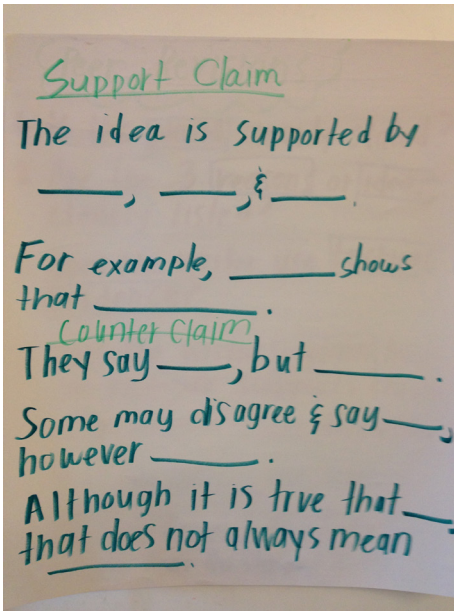


Figure 5: Discussion questions for student led revisions.

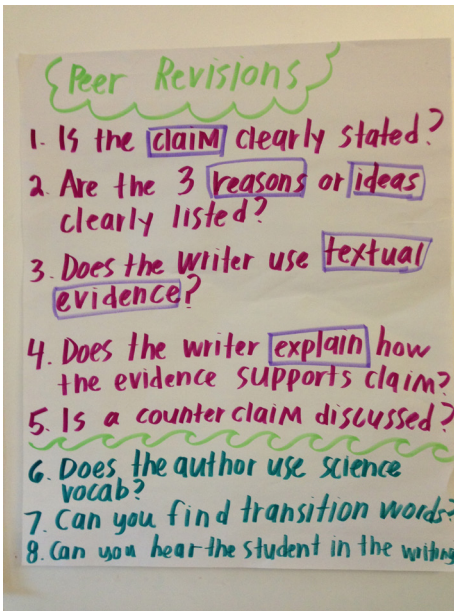


Figure 6: Stems to state claim and counter claim.

During the writing process, students will be introduced to argumentative writing. Explicit modeling of stating a claim and how to organize the argument will be needed. Students will use Popplet Lite to create their graphic organizers to guide their argument. Students will be provided with sentence stems and writing frames as needed.

Over the course of the month, students will read multiple articles and watch the documentary “Elephants in the Living Room” to write an argumentative essay to answer one of the following questions: Should there be laws in place to regulate exotic pet ownership? Should animals ever be introduced to a new ecosystem? Students will use evidence from the assigned articles, the documentary, and will research additional articles to defend their claim or counter a potential rebuttal. Students will use the conversation roundtable strategy to brainstorm, revise, and edit their writing. Guiding questions to facilitate the dialogue are pictured in Figure 5.

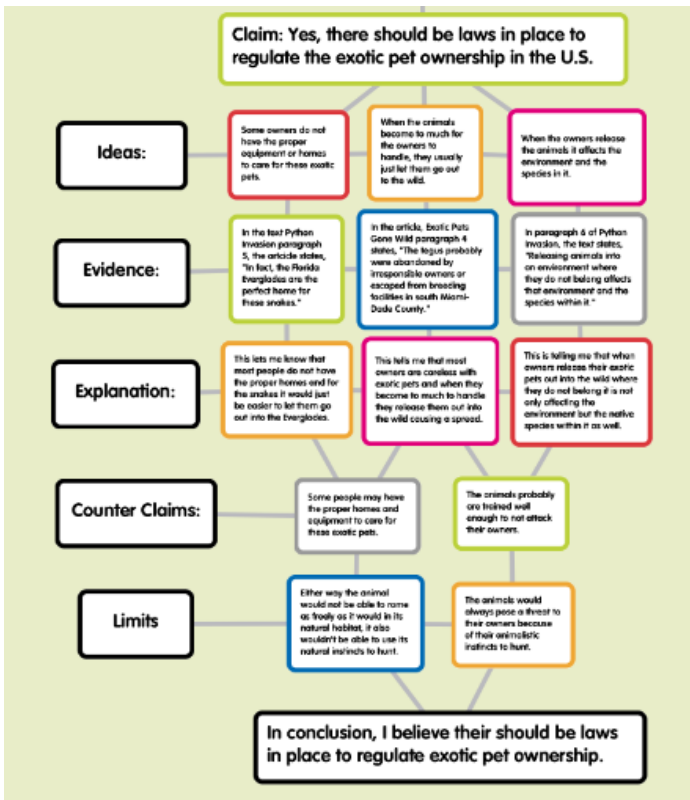


Figure 7: Student created outline using Popplet Lite.

Materials & Resources Needed:

- Printed Articles: <https://newsela.com/?needle=invasive+species>
- Exotic pets gone wild: Tegulizard wreak havoc on Florida’s ecosystem <https://newsela.com/articles/environment-tegulizard/id/1335/>
- A Beautiful by deadly predator stalks the Gulf of Mexico <https://newsela.com/articles/invasive-lionfish/id/4288/>
- Pet turns pest: California king snakes rampage the Canary Islands <https://newsela.com/articles/kingsnake-canaryislands/id/3774/>

- Anchor Charts
- Annotations Symbols
- Argumentative Writing Steps
- Sentence Stems
- Transitions
- Peer Revision Conversation Guide

Video Clips:

The Python Problem: <http://www.pbs.org/wnet/nature/lessons/the-python-problem/video-segments/5699/>

Biological Invaders: <http://illinois.pbslearningmedia.org/resource/tdc02.sci.life.eco.bioinvaders/biological-invaders/>

Documentary:

Elephant in the Living Room <http://theelephantinthelivingroom.com/>

Technology:

- iPads/ computers
- Mind Mapping applications (Popplet Lite/Mindmeister)
- Annotating applications (Educreations)
- Socrative.com or Socrative application

Rubrics:

- Conversation Roundtable
- Annotations
- Argumentative Writing

Science Argumentative Writing Conferences/Assessment:

Student's Name: _____ Date: _____

What I did well	Areas to further develop	Feedback notes
<ul style="list-style-type: none"> • Used precise language and content-specific vocabulary • Used correct sentence structure • Used appropriate punctuation • Introduced claim and supporting ideas • Maintained a formal style • Used appropriate and varied transition words/ • Used textual evidence to support claim • Conclusion included synthesis • Produced clear and coherent writing appropriate for the task, audience, and purpose 	<ul style="list-style-type: none"> • Used precise language and content-specific vocabulary • Used correct sentence structure • Used appropriate punctuation • Introduced claim and supporting ideas • Maintained a formal style • Used appropriate and varied transition words/ • Used textual evidence to support claim • Conclusion included synthesis • Produced clear and coherent writing appropriate for the task, audience, and purpose 	

Laminated accountable talk stems:

<http://www.teacherspayteachers.com/Product/Accountable-Talk-Stems-and-Expectations-955548>

Lesson Activities & Sequence:

Include explicit instructions & differentiation measures: how materials & resources are used, time, grouping, etc.

Anticipatory Set:

Pre-assessment journal question: How can an introduced species impact an ecosystem?

Think:

- The question should be preloaded to socrative.com. Students access the prompt via Socrative app or website by typing in the class code to respond to the journal question.
- Before answering the prompt, identify key vocabulary words essential to understand what it is asking. Students should highlight

the words introduced species and ecosystem. Use word analysis to break down the word ecosystem.

Do we notice any important word parts? Eco- What other words include this word part? Ecology, ecologist, etc. Based on our understanding of the word part eco- what does the word ecosystem probably mean?

Pair: Students will turn to an elbow partner to share their response to the question. (2 minute)

Share: Students will discuss their partner's ideas during a whole group share.

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Create a web of concepts that related to introduced species to activate prior knowledge.

I do:

Explain that as we have read or science articles, we have learned that there are advantages and disadvantages of introducing a new species to an ecosystem. Introduce the strategy conversation roundtable. Conversation roundtable allows students to collaboratively discuss a thought question, actively listen and comment on ideas that have been stated, and apply their understanding of course concepts.

Using a four square graphic organizer similar to the one below, students will respond to the prompt: Should a species be introduced to a new ecosystem? This will require us to use evidence from the text, video clips, and our prior knowledge to engage in an argument with our peers.

We Do:

Students will be given 5 minutes to generate a list of the advantages and disadvantages of introducing a species into a new ecosystem using the top left square of their graphic organizer. When the timer buzzes, students will partner with an elbow partner to share their list of advantages and disadvantages in a three minute period. Any idea that is discussed that is not already listed in the student's graphic organizer will be added to the first box (shown above). The class will return to whole group to record their ideas on a class anchor chart. In the second box on the top left, students will be given five minutes to independently respond to the prompt using their own ideas and evidence from the text.

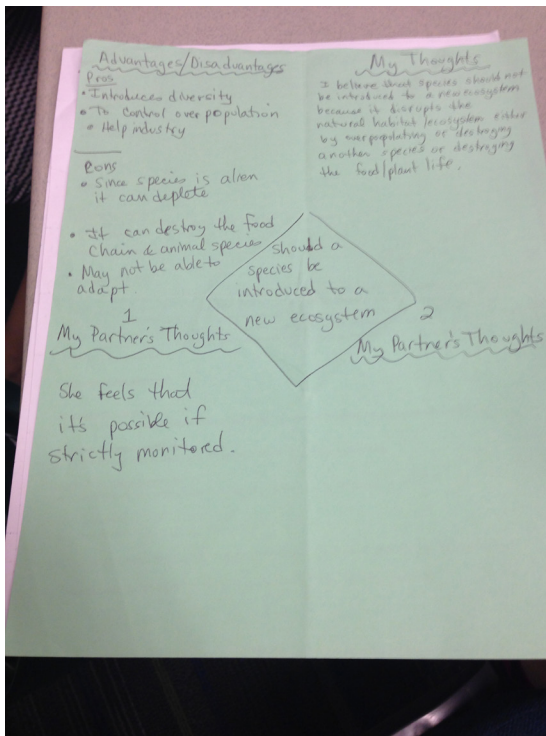


Figure 9: Student Work Sample.

*If students do not have experience with conversation roundtable, model how to use the accountable talk stems and discussion.

You Do With Partner:

With a second thinking partner, students will use accountable talk stems to discuss their ideas for 4 minutes. Students will record their partner's claim, key points, and/or evidence to support their claim. Students will rotate to interact with a third partner and repeat steps to complete the fourth box on the conversation roundtable graphic organizer.

Closing:

Discuss the process of conversation roundtable in whole group. Ask Reflection question: What did you and your partner do well? What did you and your partner struggle with? How can you make changes to improve your dialogue later? What did the class look like while you were dialoguing with your peers? What did the classroom sound like? What skills must we integrate to effectively engage in conversation roundtable?

Exit Ticket: Respond to the same bell ringer prompt on Socrative. Download excel spread sheet with the data and compare bell ringer and exit ticket responses.

Proficiency:

Elements	1	2	3
Key Ideas	Few key ideas with textual support or analysis.	Some key ideas included with some textual support and analysis.	Major key ideas are included with textual support and analysis.
Participation	Limited participation in the discussion. Does not try to add to the discussion. Off task conversations.	Some participation in discussion. Adds 1-2 ideas to the discussion. Sometimes has off task conversations	Active participation in discussion. Adds 3+ ideas to discussion. Uses accountable talk stems to enhance conversation.
Graphic organizer	Graphic organizer is incomplete. Summary of partners' responses is incomplete.	Some of the boxes are accurately complete. Includes brief summary of partners' responses.	All boxes are completed accurately. Includes detailed summary of partners' responses.

Feedback

Teachers As Learners:

The lesson maximizes instructional time by using the timer. Students were constantly engaged in discussion and had limited opportunities to be off task. The teacher must be conscious of diverse learners and should provide appropriate scaffolding as need. The teacher made informal observations of discussions, modeled an academic conversation by joining the discussion while using the accountable talk stems, and prompted students with extensions to continue the dialogue.

Elements of Pretty Good Practice:

The lesson was integrated, which included reading, writing, communication, and science to explore the ecological issue of introduced species. There is evidence of formal and informal assessments such as bell ringer pre-assessments, conversation roundtable graphic organizers, and post-assessment exit tickets. Using Socratic as a discussion format allowed students to safely communicate their thoughts and showed the teacher their current understanding of the topic. The use of the graphic organizer provides students with a way to structure and organize thoughts. Providing students will flexible grouping promoted positive student-to-student discourse and respect while exposing students to different viewpoints.

Modifications and Adaptations:

- Integrate cross-disciplinary vocabulary strategies. Include Frayer models, vocabulary journals, vocabulary mapping, non-linguistic representations of vocabulary words, and clearly post vocabulary words on chart paper or the board.
- Provide pre-made a conversation roundtable graphic organizer to students with special needs such as IEPs and EL support.
- Provide materials in native languages for ELLs.
- Provide students with a peer scribe, digital version of the graphic organizer, or offer video commentary for students with fine motor deficits and/or limited English proficiency.

Questions Arisen:

- How can mathematics be integrated into instruction?
- What tech resources can enhance the lesson and accomplish the objectives?
- How will students be assessed formally and informally throughout the unit?

Peer Feedback

Overall, the lesson supports science, English language arts, and communication standards providing students with rich opportunities to critically think, problem solve, discuss, and obtain and analyze information about ecology concepts.

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