STONE SOUP Cartooning and Invasive Species

Grades: Adaptable to 4th – 12th grades

Length: Depending on the level and how teachers adapt this lesson, the time needed ranges from 2-3 days to 2 weeks.

Topics: science (life science, ecology), language arts, art.

Learning Objectives:
• Students will be able to develop and apply science, reading and language arts processes to analyze a comic series.
• Students will be able to use cartooning to express science content.
• Students will be able to demonstrate writing skills in creating their own comic about a local invasive species.

Materials:
• Copies of Stone Soup Comics series by Jan Eliot (7/31-8/3 and 9/4- 9/14/2013) separated into two groupings.
• Copies of invasive species primers, guides and resources including videos to build content knowledge on red swamp crayfish and invasive species. (see additional attached suggestions)
• slips of scrap paper
• paper and coloring pencils
• graphic organizer (see example at http://seagrant.oregonstate.edu/invasive-species/toolkit)
• tape to hang graphic organizers

Engage:
1. Lead a brief group discussion:
   a. Who likes to read comics?
   b. What are some of the reasons people write comics?

2. Hand out slips of paper to table groups / individuals.

3. Have students take a minute to jot down 2-3 different comics they like to look at; collect.

4. Briefly share some of the choices collected, with student participation.

5. Discuss some of commonalities of structure and content of comics (e.g., 1-8 panels, familiar, odd or endearing characters, irony, presenting and resolving a problem, etc.)

Explore:
1. Read the first set of four cartoons from Stone Soup, using these questions to guide a whole class discussion:
   a. How would you describe the relationship between Alix and her Grandmother? What is your evidence of their relationship?
   b. What are some possible solutions for the crawdad or crayfish in the tub?
   c. What is the main idea that is presented in this set of cartoons? What is your evidence that is the main idea?
   d. In the last slide, the crayfish says, “Look out below! Invasive species in the house!” Talk with your classmate and discuss what you think this means.
2. Describe the Structure Comic Strips:
   a. Explain that the text in the cartoon fit into a word bubble on the top of each frame.
   b. The text included must be legible and fit in the bubble (not touch the drawings).
   c. The main character should be drawn consistently in each frame.
   d. TIP: To encourage the use of technology, and reduce the time needed to format drawings and text so it fits, you can use on-line comic strip builders. See the resource list below for the links.

3. Break into small groups. Explain that you are now going to develop expertise about a crayfish to better analyze the next set of comics. Each member of the team reviews one or more references to gather information to create a graphic organizer that explains the red swamp crayfish and why it is successful as an invasive species.

Explain:
1. Do a gallery walk to view the graphic organizers.
2. As a group, brainstorm the key characteristics of crayfish that make them successful invasive species.

Expand:
1. Distribute the second set of Stone Soup comics to small groups or individuals, and have the students read through the strips.

2. Discussion questions:
   a. What is the main idea of this set of comics?
      i. What evidence do you have that supports that idea?
   b. State the author’s point of view about what happened in your own words. What evidence do you have to support this?
   c. Identify some vocabulary words you learned to understand the other words to know what was being said. How were you able to clarify the meaning of those words?
   d. Comparison: How do the characters' roles change from the first set to the second set of comics?
   e. Give an example of an illustration that supports the text emphasizing a point or making it easier to understand.
   f. Explain: What method did the students use to survey the population of crayfish? What did the students observe in the stream (e.g., find or not find)?
   g. What are some examples of how the author uses humor in talking about invasive species?
h. Prediction: What do you think would happen if they left the crayfish named “Pinchy” in the stream instead of taking it back to school?

i. Explain: Why does the teacher have the letters NOAA on her vest?

j. Research: What crayfish (if any) are native to your region? Are these native crayfish still present in the community you live in? If not, why not? How would you find out? What crayfish native to the Pacific Northwest has become the dominant invasive crayfish in California? How did this crayfish arrive in California? What are some alternatives to releasing unwanted animals from your home or school into the wild?

k. Evaluation: The cartoonist Jan Eliot contacted Oregon Sea Grant to check her facts before completing these strips. Why was that important for her as an artist?

l. Summarize: What are the main themes and lessons from the comic strip series? Who are the main characters and what are their roles? What did Alix and her grandmother learn? What did you learn and how would you share it with others?

m. Analysis: If you had to change some of this set of strips, how would you revise it? Please explain why you would make that change.

n. Commentary: Did you find it interesting to learn from a comic strip? Why?

3. Select one character from the strip and write a narrative of what happened in the comic from that character’s point of view. Include the overall theme of the comic in your writing. You can use the background information from your research to add details that weren’t included in the comic.

Evaluate: Comic Challenge!

GOAL: Create a comic that tells the story of the threat of an invasive species.

1. Use any species that is currently known to be invasive where you live, and create a comic that shows the threat of this invasive species to the local ecosystem(s).

2. Components you need to include in your comic are:
   - A title slide that includes the writer/artist
   - Both common and scientific name of the species
   - The method of transport into the local ecosystem—vector(s)
   - The location(s) where it has been found
Stone Soup in the Classroom: Where art and science meet

- The characteristics that make it successful as an invasive species
- The problems it causes by invading the area
- Identify if anyone is involved in solving this problem

3. Vocabulary / terms you might want to include are:
   - Habitat
   - Invasive
   - Introduced
   - Competition
   - Biodiversity
   - Adaptation
   - Vectors
   - Predators
   - Reproduce
   - Ecosystem

4. Be certain you develop your characters well, and have your work edited before turning the final comic in; show your work to at least one other person for a critique and suggestions.

5. Include your research citations on a separate page.

Extension:
1. Identify other media used to communicate invasive species messages.
2. Investigate the different skills needed to create a comic strip (writer, researcher, artist, inker, printer, publisher, etc.).
3. Research and clarify your own ideas about artists having a role in addressing problems in our environment or society.

Additional resources:
1. Comics and crayfish.
   http://blogs.oregonstate.edu/wise/2013/09/03/comics-and-crayfish/
2. Invasion of the shelter snatchers: behavioural plasticity in invasive red swamp crayfish, Procambarus clarkii.
3. Classroom culprits: Invasive Crayfish Threaten Western Waterways. PBS/Oregon Public Broadcasting
   http://seagrant.oregonstate.edu/sgpubs/e-11-013
5. Louisiana crawfish released in wild from classrooms across the nation.
6. Louisiana crawfish wreaking havoc around the world.
   http://www.dailycomet.com/article/20120818/articles/120819625
7. Invasive species could be transmitted by school teachers releasing critters into the wild.
   http://www.oregonlive.com/environment/index.ssf/2012/08/invasive_species_could_be_tran.html
8. UW Professor leading efforts to eliminate invasive crayfish.
   http://sammamishreview.com/2013/03/06/uw-professor-leading-effort-to-eliminate-invasive-crayfish-in-pine-lake
10. Our crayfish are better than yours. [Link]

11. The state of crayfish in the Pacific Northwest. [Link]

12. Fighting the Bay Area Invasion of Signal Crayfish By JOE EATON Special to the Planet. [Link]

13. Understanding the invasion ecology of invasive crayfish in California [Link]

14. The Nab the Aquatic Invader website contains learning resources and tools developed for teachers to incorporate invasive species learning into lesson plans. The website also includes a poster with “Don’t Let it Loose” information and an “Adoption Pledge for Classroom Pets.” [Link]

15. Beliefs Comics includes tips, ideas and additional curriculum for teachers [Link]

16. Read Write Think offers an easy platform for quick comic making [Link]

17. Make comic strips in seconds with this easy to use resource: [Link]
Stone Soup by Jan Eliot (7/31-8/3 and 9/4-9/14/2013)

Alix, where’s that critter you brought home from camping?

What critter? I don’t see a critter.

Wow, Alix. That’s the biggest crawdad I’ve ever seen.

Cool, huh?

Alix, this crawdad needs to go back to its natural habitat.

But I wanna keep him!

I think your crawdad will like the creek in this park.

Are you sure?

You had something in a jar.

Yes, but he can’t be happy in our tub. He looks kind of agitated.

He was fine until Holly started screeching.

I was 9 once...

I’m sure you do, but he’ll just die.

How do you know??

Just until I can dig a pond for it!

Get it out now!

Well, we can’t drive him all the way back to the lake where you found him, so this’ll have to do.

He’s pretty big. I bet he can hold his own.

Look out below!! Invasive species in the house!
Stone Soup in the Classroom: Where art and science meet

Gramma, guess what? Our science teacher is taking us on a field trip to the park.

We're going to study crandads.

Class, every year I bring students here to count crandads.

We've found that the numbers change based on weather and the presence of predators.

Everyone fan out, and leave no stone unturned!

Ms. Erma? We can't find any crandads at all!

Really? Last year we counted 57!

This is strange... This crandad isn't native to this area.

You must not be looking in the right places, let's move this big rock.

Procambarus Clarkii is invasive! It displaces other crandad populations.

How did it get here?

I plead the fifth.

Yum. Those little guys look tasty.

I hate field trips.

Hello!

Pinchy!

You named it already? No fair!

Aquatic Invasions: A Curriculum for West Coast Aquatic Invasive Species Education

October 2013
Stone Soup in the Classroom: Where art and science meet

Alix: Do you know something about this huge, invasive crawdad?

Um, well...

Alix: The #1 rule of a biologist is never move something from one habitat to another.

Your crawdad was fine in the lake where you found it... but here he's heavily reduced the local population!

"Reduced"? As in—

Eaten.

Pinchy, no!

Gramma, guess what? The crawdad we let go in the park got really huge!

He ate all the other crawdads, and he's really a she and she's pregnant!

What did your teacher do with the crawdad we released?

Tanked it to our class room so we can observe it.

So... all's well that ends well.

She said to tell you what you did was against the law.

Hey, you brought the crawdad home from the lake!

Oh, sure, blame the kid.

If you weren't 9, you'd be in big trouble.

I'll warn Gramma. She helped me and she's way older than 9.
Stone Soup in the Classroom: Where art and science meet

MS ERMA? I'M ALIX'S GRANDMOTHER.

THE ONE WHO RELEASED THE PREGNANT CRAPAD IN THE CREEK?

I DIDN'T KNOW IT WAS AN INVASIVE SPECIES! I THOUGHT A CRAPAD WAS A CRAPAD!

IN THIS CASE, CRAPAD MOM.

ALIX TOLD ME THE CRAPAD IS PREGNANT. WILL THE BABIES SURVIVE IN HERE?

THEY'RE VERY ADAPTABLE. THAT'S WHY THEY'RE SO INVASIVE.

WHAT WILL YOU DO WITH THEM ALL AT THE END OF THE SCHOOL YEAR?

I'M THINKING... ETROFFEE!

WHAT??

I LIKE MINE SPICY...YOU?
Common Core Standards – Comic

Reading standards for informational text
Key Ideas and Details
6th grade
2. Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

7th grade
2. Determine a theme or central idea of a text and analyze its development over the course of the text; provide an objective summary of the text.

8th grade
2. Determine a theme or central idea of a text and analyze its development over the course of the text, including its relationship to the characters, setting, and plot; provide an objective summary of the text.

9th-10th grade
2. Determine a theme or central idea of a text and analyze in detail its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text.

11th – 12th grade
2. Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text.

5. Analyze how an author’s choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.

Craft and Structure:
4th grade
5. Describe the overall structure (e.g., chronology, comparison, cause/effect, problem/solution) of events, ideas, concepts, or information in a text or part of a text.

5th grade
6. Analyze multiple accounts of the same event or topic, noting important similarities and differences in the point of view they represent.

6th grade
6. Explain how an author develops the point of view of the narrator or speaker in a text.

7th grade
6. Analyze how an author develops and contrasts the points of view of different characters or narrators in a text.

8th grade
6. Analyze how differences in the points of view of the characters and the audience or reader (e.g., created through the use of dramatic irony) create such effects as suspense or humor.

Reading standards for informational text
6th grade
6. Determine an author’s point of view or purpose in a text and explain how it is conveyed in the text.

7th grade
5. Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to the development of the ideas.
6. Determine an author’s point of view or purpose in a text and analyze how the author distinguishes his or her position from that of others.

8th grade

1. Cite the textual evidence that most strongly supports an analysis of what the text says explicitly as well as inferences drawn from the text.

6. Determine an author’s point of view or purpose in a text and analyze how the author acknowledges and responds to conflicting evidence or viewpoints.

Integration of knowledge and Ideas

4th grade

7. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.

5th grade

9. Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

6th grade

7. Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.

8th grade

7. Evaluate the advantages and disadvantages of using different mediums (e.g., print or digital text, video, multimedia) to present a particular topic or idea.

Writing Standards

Text types and purpose

4th/5th grades

3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
   a. Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally.
   b. Use dialogue and description to develop experiences and events or show the responses of characters to situations.
   e. Provide a conclusion that follows from the narrated experiences or events.

6th – 8th grades

3. Write narratives to develop real or imagined experiences or events using effective technique, relevant descriptive details, and well-structured event sequences.
   a. Engage and orient the reader by establishing a context and point of view and introducing a narrator and/or characters; organize an event sequence that unfolds naturally and logically.
   b. Use narrative techniques, such as dialogue, pacing, and description, to develop experiences, events, and/or characters.
   e. Provide a conclusion that follows from and reflects on the narrated experiences or events.

9th – 12th grades

3. Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.
a. Engage and orient the reader by setting out a problem, situation, or observation and its significance, establishing one or multiple point(s) of view, and introducing a narrator and/or characters; create a smooth progression of experiences or events.

b. Use a variety of techniques to sequence events so that they build on one another to create a coherent whole and build toward a particular tone and outcome (e.g., a sense of mystery, suspense, growth, or resolution).

c. Provide a conclusion that follows from and reflects on what is experienced, observed, or resolved over the course of the narrative.

Production and distribution of writing

4th and 5th grades
5. With guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach. (Editing for conventions should demonstrate command of language standards 1-3 up to and including grade 4 -5.)

6th – 8th grades
5. With some guidance and support from peers and adults, develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on how well purpose and audience have been addressed. (Editing for conventions should demonstrate command of Language standards 1–3 up to and including grades 6 - 8.)

9th – 12th grades
5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. (Editing conventions should demonstrate command of language standards 1 – 3 up to and including grades 9 – 12.)

Research to Build Knowledge

4th and 5th grade
7. Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic.

6th - 8th grades
7. Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

9th – 12th grades
7. Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

Speaking and Listening Skills

4th grade
2. Paraphrase portions of a text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.

5th grade
2. Summarize a written text read aloud or information presented in diverse media and formats, including visually, quantitatively, and orally.
Reading standards for literacy in science and technical subjects

Key ideas and Details

6th – 8th grades
2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

9th – 10th grades
2. Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

Next Generation Science Standards

**MS-ESS3-3.** Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment

**MS-LS2-5.** Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

**HS-LS2-6.** Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

**HS-LS2-7.** Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity

**HS-ESS3-4.** Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.