

Culminating Science Content Literacy Unit Plan

Anne Schmitt

SEDU 607: Content Literacy with Dr. Baron

Edinboro University of Pennsylvania

Introduction

This culminating Content Literacy Unit integrates 6th and 7th grade astronomy content with reading of the young adult novel Every Soul a Star. The book introduces three teenage narrators who meet at a campground that is hosting a total solar eclipse viewing. Science topics explored throughout the novel include eclipses, meteorites, comets, constellations, exoplanets, the scientific research process, scientific instruments such as telescopes and spectrometers, and the search for extraterrestrial life. Most importantly, the book conveys an infectious sense of excitement over observing natural phenomena in space.

Students will begin the unit by reviewing what they know about space and generating questions about what they would like to know. As students read, they will record new information that they learn about space in a **KWL chart**. The KWL will serve as a convenient method for students to track the scientific information in the story during reading. It also allows students to check their initial understanding and directly relate the text to the facts they learn.

Students will then review the idea of classification to differentiate between celestial objects such as comets, asteroids, planets, and moons. By recording the information in a **Word Grid**, students will be able to classify the various objects in our solar system by their features. The Word Grid is helpful because it furthers student understanding of astronomical objects in an easy-to-read format. Students gain science literacy through the practice of extracting and organizing information from a text.

The culminating event in Every Soul a Star is the few minutes of eclipse totality experienced by the characters. The book's vivid fictional depictions of the eclipse convey the experience of directly observing an awe-inspiring natural phenomenon, a lifelong excitement that science teachers should spark in their students. Students will closely read the observations of

one of the narrators to determine the stages of a total solar eclipse. Students will use this information to inform their illustration of the stages of an eclipse in an **Adjunct Display**. Additionally, students will practice inferring scientific events from a fictional text. By creating illustrations of the phases of a total solar eclipse, students will be able to imagine what the characters are experiencing and back up those depictions with scientific fact.

Finally, students will use **RAFT Writing** to create a how-to guide on the tools used and safety precautions taken when viewing a total solar eclipse. Students will be able to follow the procedures to view an eclipse on their own - or to teach someone else how to do so. Because the upcoming path of totality of the solar eclipse of 2024 includes Erie, PA, students will be primed to participate in this once-in-a-generation event when it comes.

Several additional instructional routines could be used with this content. **Conversation Roundtables** could help groups organize their research around the WHAT, WHEN, WHERE, and WHY of the 2024 total solar eclipse. Members would each contribute research, and then use this information in their written brochures. Students could create a **Vocabulary Card** for each key science term encountered in the book (e.g. totality, exoplanet, Alpha star, spectrometer, Messier objects). Each Vocabulary Card would include the word, definition, illustration, characteristics, and examples. **Split Page Notetaking** would be an alternate strategy to the KWL chart. Students could take split-page notes on key science concepts during reading. **Popcorn Review** would allow the class to recall the rich content in the book by allowing students to freely make connections between science concepts. Finally, the **Question-Answer Relationship** strategy would be useful for the intersection of fiction and science in this text because it teaches students a framework for where to seek answers to questions: directly from the text, inferred from the text, or from their own experience and research.

Name: Anne Schmitt

Date: 7/2/18

Lesson Details

Lesson Title

Introduction to Astronomy Unit and Every Soul a Star using **KWL(H) Charts**

Content Area

Science

Grade Level

6th and 7th grade level

Timeline

Lesson 1 of 4

Date of Lesson

Unknown at this time

UBD Stage I: Identify Desired Results

Enduring Understandings

- Understand Earth's context in our solar system and our solar system's context in the Universe.
- Be able to build mental models of science concepts by integrating previous knowledge with text.

Standards

[CCSS.ELA-Literacy.RST.6-8.1](#)

Cite specific textual evidence to support analysis of science and technical texts.

Lesson Objectives

In this lesson students will record what they know about space, their questions about what they would like to know, and what they learn about space as they read Every Soul a Star using a **KWLH** chart. The chart will include an H column so students can identify *How* they know what they learned with specific examples from the text.

Students will:

List (apply) facts that they know about space on the **KWLH** chart with **25% accuracy**.

Compose (create) relevant questions about what they would like to learn about space on the **KWLH** chart with **75% accuracy**.

Discuss (evaluate) their writing about what they know and want to learn in class discussion with 50% accuracy.

Identify (remember/understand) explicit and implicit information about space in the novel on the KWLH chart with 75% accuracy.

UBD Stage II: Determine Acceptable Evidence

Assessment Tasks

Formally assess the student's ability to **list** facts that they know about their topic, by collecting KWL charts at the end of class.

Formally assess the student's ability to **compose** relevant questions about what they would like to learn about their topic, by collecting KWL charts at the end of class.

Informally assess the student's ability to **discuss** their writing about what they know and want to learn by listening in to class discussions.

Formally assess the student's ability to **identify** explicit and implicit information about their topic in the novel, by collecting KWL charts at the end of the unit.

Assessment Adaptations

Students will be provided with the proper assessment adaptations according to their IEP.

Rubric/Scoring Criteria

A KWL Project Grading Rubric will be used. Students will be assessed on the number of entries in each column, answering their own questions in the W column, including additional information they learned, citing from the text to show how they learned, and grammar and punctuation. 5 points will be graded for the "K" and "W" sections and 5 points for the "L" and "H" sections, for a total of 10 points.

UBD Stage III: Plan Learning Experiences and Instruction

Materials and Resources

The book, [Every Soul a Star](#), 25 copies

A whiteboard

Pencil/ Pen/ Paper

Journals

Audiovisuals- the video "[The Known Universe by AMNH](#)"

Anticipatory Set

(T) Will show the video “The Known Universe by AMNH” (6 minutes)

(S) Will record at least 5 facts they learned from the video or already know about the universe (5 minutes)

Procedures and Content

(T) Will explain the KWLH chart and how the class will use it to record what we know and what we would like to know (3 min.)

(T, S) Will identify examples of the facts they recorded as teacher writes them in the K column on the whiteboard (5 min.)

(T) Will prompt students to think about what they would like to know about space, astronomy, stars, or the planets after watching the video and thinking about what they already know (2 min)

(T) Will model questioning by offering two examples that begin with “I wonder...” (2 min)

(S) Will identify and record questions they have and things they wonder on their KWL charts (7 min)

(T, S) Will share examples of questions they had as teacher records on the whiteboard KWLH chart. (2 min)

(S) Will have read the assigned chapters 1-7 for the book.

(T) Will explain how the “L” and “H” columns will show what students learn from the novel as they read and how they know it by excerpting the text (3 min)

(T) Will project pages 37-38 and ask students to scan for astronomy knowledge they find in the text (3 min.)

(S) Will identify what facts they can determine about meteors from the text (5 min.)

(T) Will model how to write a fact from the novel in the L column and a brief quote and page number in the H column (5 min)

(T) Will provide students with a grade on their KWLH charts. (At the end of the unit)

Closure

(S) Will be challenged to write two additional facts about meteors with the corresponding page number and brief quote from the text in the L and H columns (10 min.)

Homework

Students are to *read chapters 8-14 of Every Soul a Star and continue recording information in their KWLH chart.*

If Time Activities

(S) If time persists, students will continue silently reading Every Soul a Star.

Procedural Adaptations/Differentiated Instruction

- For students that are **struggling readers**, additional time will be allotted, and reading help will be given.
- For **ELL students**, they will be provided with an ESL instructor to ensure they are able to read the book in English. When using audiovisuals, ELL students may view them in another language if applicable. ELL students may need translation of unfamiliar

astronomy vocabulary, and the teacher will provide an applicable study guide with images.

- For **gifted students** that prefer their own individualized assignments on the book, then those may be provided.
- **Students with physical needs** will given accommodations and aids as it suits their needs.
- For **students with cognitive needs**, individualized instruction worksheets will be given, and extra help will be offered.
- For **student with behavioral issues**, individualized assignment and text accommodations will be provided.

Lesson Reflection

Edit: Reflect on the lesson. This is NOT a place to rewrite what you did. It is a time to think about if what you did mattered. If you are writing this for a class and you will NOT actually conduct the lesson, YOU DO NOT HAVE TO COMPLETE THIS SECTION.

Name: Anne Schmitt

Date: 7/3/18

Lesson Details

Lesson Title

Analysis of types of astronomical objects in Every Soul a Star using **Word Grid/Semantic Feature Analysis**.

Content Area

Science

Grade Level

6th and 7th grade level

Timeline

Lesson 2 of 4

Date of Lesson

Unknown at this time

UBD Stage I: Identify Desired Results

Enduring Understandings

- Students will be able to compare and contrast related science terms.
- Students will be able to interpret major themes in relation to main characters.

Standards

[CCSS.ELA-Literacy.RST.6-8.4](#)

Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

Lesson Objectives

In this lesson the students will be comparing and contrasting types of astronomical objects (comets, asteroids, planets, moons, etc.) using a Word Grid. Students will gain an understanding of the celestial objects discussed throughout Every Soul a Star.

Students will:

Compare (analyze) related terms through semantic feature analysis in class discussion, with 75% accuracy.

Identify (remember/understand) instances of each astronomical object as it was mentioned in context of Every Soul a Star through **small group discussion** with **50% accuracy**.

Classify (analyze) astronomical objects by their semantic features, through **group discussion** with **50% accuracy**.

Record (apply) the correct classification of the celestial objects in a **word grid**, with **75% accuracy**.

UBD Stage II: Determine Acceptable Evidence

Assessment Tasks

Informally assess student's ability to **compare** related terms through semantic feature analysis, by listening to class discussion.

Informally assess student's ability to **identify** instances of each astronomical object as it was mentioned in context of Every Soul a Star, by asking small groups to write their answers on a sheet of paper.

Informally assess student's ability to **classify** astronomical objects by their semantic features, by observing small group discussions.

Formally assess the student's ability to **record** the correct classification of the celestial objects, by collecting word grids at the end of class.

Assessment Adaptations

Students will be provided with the proper assessment adaptations according to their IEP.

Rubric/Scoring Criteria

Students will be graded on their ability to record the classification of astronomical objects in a word grid. A total of 5 points will be awarded.

UBD Stage III: Plan Learning Experiences and Instruction

Materials and Resource

The book Every Soul a Star- 25 copies

A whiteboard

Paper/pencils/ computer (word processor)

Audiovisual – the video “[What's the difference between Comets...](#)”

Anticipatory Set

(T) Will prompt students to list 2 types of pets and 2 commonalities and 2 differences between the pets (2 min.)

(S) Will record the 2 types of pets and list their commonalities and differences in their journals (7 min.)

Procedures and Content

(T) Will begin class by asking students what it means to classify. (2 min.)

(T, S) Will share examples of pets they listed in their journals and a similarity and difference as teacher fills out a word grid on the whiteboard (5 min.)

(T) Will ask students yes or no questions to fill in each block in the grid “Are cats kept in tanks?” (2 min.)

(S) Will have read assigned chapters of the novel.

(T) Will explain the term astronomical object (2 min.)

(T) Will show the video “What’s the Difference Between Comets, Asteroids, Meteoroids, Meteors & Meteorites?” (4 min)

(S) Will create a list of astronomical objects in small group discussions, using their texts as necessary to recall astronomical objects mentioned in the text. Student will include at least 6 astronomical objects in their word grid. (4 min.)

(S) Will identify defining features of the astronomical objects in small group discussion, recording at least 4 defining features in their word grid. (10 min.)

(T) Will provide students with a grade on their word grids. (At the start of next class)

Closure

(S) Will be challenged to fill in each block of the word grid with a Yes/No answer in their groups. Students can use their text for reference. (15 min.)

Homework

Students are to *read chapters 14-19 of Every Soul a Star* and continuing filling in their KWLH chart from the previous lesson.

If Time Activities

(T, S) If time persists, we will generate a word grid as a class and review the student’s answers.

Procedural Adaptations/Differentiated Instruction

- For students that are **struggling readers**, additional time will be allotted, and reading help will be given.

- For **ELL students**, they will be provided with an ESL instructor to ensure they are able to read the book in English. ELL students may need translation of unfamiliar astronomy vocabulary, and the teacher will provide an applicable study guide with images.
- For **gifted students**, they will be challenged to expand their word grid to include 10 types of astronomical objects.
- **Students with physical needs** will given accommodations and aids as it suits their needs.
- For **students with cognitive needs**, individualized instruction worksheets will be given, and extra help will be offered.
- For **students with behavioral needs**, accommodations will be made to suit their needs, specifically during small group work.

Lesson Reflection

Edit: Reflect on the lesson. This is NOT a place to rewrite what you did. It is a time to think about if what you did mattered. If you are writing this for a class and you will NOT actually conduct the lesson, YOU DO NOT HAVE TO COMPLETE THIS SECTION.

Name: Anne Schmitt

Date: 7/4/18

Lesson Details

Lesson Title

Interpreting an excerpt from Every Soul a Star to chart the stages of a total solar eclipse using an **Adjunct Display**.

Content Area

Science

Grade Level

6th and 7th grade

Timeline

Lesson 3 of 4

Date of Lesson

Unknown at this time

UBD Stage I: Identify Desired Results**Enduring Understandings**

Students will be able to interpret fictional text as it relates to a scientific phenomenon.
Students will understand how a diagram can easily convey dense scientific information.
Students will understand the series of phenomena that occurs during a total solar eclipse.

Standards

[CCSS.ELA-Literacy.RST.6-8.7](#)

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Lesson Objectives

Students will closely read several pages of Every Soul a Star during which the characters observe the total solar eclipse. Students will interpret the text in order to express the stages of a total solar eclipse visually through a flow diagram, including key science terms in the diagram (crescent, totality, chromosphere, etc.)

Students will be able to:

Infer (create) the events of the total eclipse through the narration of characters through **group discussion** with **50% accuracy**.

List (apply) the steps that occur during a total solar eclipse **in their journals** with **50% accuracy**.

Identify (remember/understand) key science terms at each stage of the total solar eclipse in an **adjunct display** with **75% accuracy**.

Construct (apply) a flow diagram illustrating the stages of a total solar eclipse by **filling out an adjunct display** with **75% accuracy**.

UBD Stage II: Determine Acceptable Evidence

Assessment Tasks

Teacher will:

Informally assess the student's ability to **infer** the events of the total eclipse through the narration of characters, by observing group discussions.

Formally assess the student's ability to **identify** key science terms at each stage of the total solar eclipse, by collecting adjunct displays at the end of class.

Formally assess the student's ability to **construct** a flow diagram illustrating the stages of a total solar eclipse, by collecting adjunct displays at the end of class.

Assessment Adaptations

Students will be provided with the proper assessment adaptations according to their IEP.

Rubric/Scoring Criteria

The students will be graded on their adjunct display of a total solar eclipse. Up to 5 points will be awarded.

UBD Stage III: Plan Learning Experiences and Instruction

Materials and Resources

Journals

The book [Every Soul a Star](#) 25 copies

Worksheets/pencils/pens

Whiteboard

Audiovisuals- The video "[Best scenes from the 2017 Great American Eclipse](#)"

Flow chart "The Stages of a Total Solar Eclipse" – will be partially filled in to model for students

Anticipatory Set

(T) Will play the video "[Best scenes from the 2017 Great American Eclipse](#)". (2 min.)

(T) Will show students the map of the path of totality of the April 8, 2024 solar eclipse and the map of totality for the August 17, 2017 solar eclipse. (3 min.)

(T, S) Will have a brief class discussion comparing the two maps and locating cities that will be in the path of totality in 2024 (5 min.)

Procedures and Content

(T) Will begin class by projecting page 235 of Every Soul a Star (2 min.)

(T) Will provide students with an adjunct display, in the form of a flow chart entitled, “The Stages of a Total Solar Eclipse” (2 min)

(S) Will take turns reading aloud the projected text (5min.)

(T) Will pause after several paragraphs to ask students what is happening with the eclipse at each stage (5 min.)

(S) Will list the steps of the eclipse in their journals (10 min.)

(S) Will identify key vocabulary words for each stage of the eclipse on their adjunct display (3 min.)

(T) Will provide students with a grade on their adjunct displays. (At the start of next class)

Closure

Students will be provided with a flow diagram to turn in. Students will draw each stage of the eclipse and include key terms at each stage (20 min.)

Homework

Students will be asked *to read chapters 21-25 of Every Soul a Star and complete their KWLH chart*, to be turned in next class.

If Time Activities

(T/S) Students will present and narrate their flow charts to the class.

Procedural Adaptations/Differentiated Instruction

- For students that are **struggling readers**, additional time will be allotted, and reading help will be given.
- For **ELL students**, they will be provided with an ESL instructor to ensure they are able to read the book in English. ELL students may need translation of unfamiliar astronomy vocabulary, and the teacher will provide an applicable study guide with images.
- For **gifted students**, alternate assignments may be offered to fit their individual learning needs.
- **Students with physical needs** will given accommodations and aids as it suits their needs.
- For **students with cognitive needs**, individualized instruction worksheets will be given, and extra help will be offered.
- For **students with behavioral needs**, accommodations will be made to better suit their individual needs.

Lesson Reflection

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Name: Anne Schmitt

Date: 7/5/18

Lesson Details

Lesson Title

Writing a guide to eclipse viewing for the campers in Every Soul a Star with **RAFT Writing**.

Content Area

Science

Grade Level

6th and 7th grade

Timeline

Edit: 4 of 4

Date of Lesson

unknown

UBD Stage I: Identify Desired Results

Enduring Understandings

- Students will be able to write a procedural text that considers proper tools and safety.
- Students will be able to research credible online sources to build on what they know from a text.

Standards

[CCSS.ELA-Literacy.WHST.6-8.2](#)

Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

Lesson Objectives

Students will review the tools used and safety precautions taken by characters in Every Soul a Star during the total solar eclipse viewing. Students will research best practices for viewing an eclipse and integrate their research into a RAFT writing assignment. Students will write a guide for viewing the eclipse in 2024, including WHO, WHAT, WHEN, WHERE, WHY, and HOW. Student will write from the perspective of the owner of the Moon Shadow Campground for the audience of their campers. This lesson scaffolds to another lesson in which students design and illustrate a brochure about the 2024 total solar eclipse.

Students will be able to:

Discuss (evaluate) the tools and safety precautions taken by the characters in Every Soul a Star in class discussion with **50% accuracy**.

Research (remember/understand) technical information on the tools and safety required during eclipse viewing written in their journals with 50% accuracy.

List (apply) WHAT, WHERE, WHEN, and WHY the 2024 eclipse is happening in a RAFT writing assignment with 75% accuracy.

Write (create) a how-to guide for viewing the total solar eclipse in 2024 in a RAFT writing assignment with 75% accuracy.

UBD Stage II: Determine Acceptable Evidence

Assessment Tasks

Informally assess the student's ability to **discuss** the tools and safety precautions taken by the characters in Every Soul a Star by listening to class discussion.

Informally assess the student's ability to **research** technical information on the tools and safety required during eclipse viewing, by circulating the room and observing students' writing.

Formally assess the student's ability to **list** WHAT, WHERE, WHEN, and WHY the 2024 eclipse is happening, by collecting RAFT assignments at the end of class.

Formally assess the student's ability to **write** a how-to guide for viewing the total solar eclipse in 2024 by collecting RAFT assignments at the end of class.

Assessment Adaptations

Students will be provided with the proper assessment adaptations according to their IEP.

Rubric/Scoring Criteria

Students will be evaluated on a their RAFT writing for the final brochure on eclipses that will be produced in the next lesson. RAFT writing will be worth 5 points, and based on the inclusion of the key details of the 2024 eclipse as well as the safety precautions taken by characters. The final brochure will be worth an additional 10 points, based on writing quality, scientific and technical information, and creativity of design.

UBD Stage III: Plan Learning Experiences and Instruction

Materials and Resources

Journals

The book Every Soul a Star 25 copies

Worksheets/pencils/pens

Whiteboard

Audiovisual – Sample image of a hiking brochure

Anticipatory Set

(T) Will project an image of a hiking brochure for students (1 min)

(T, S) Will conduct a short class discussion on what kinds of information are included in the brochure, including safety information, and why safety is important. (7 min)

Procedures and Content

(S) Will have read assigned chapters of the book.

(T) Will ask students to discuss safety measures and precautions that were taken by characters in the book during the eclipse (7 min)

(S) Will list safety tools and procedures in their journals (7 min.)

(T) Will ask students to research information about the total solar eclipse of 2024 in small groups (2 min)

(S) Will research the 2024 eclipse in small groups, finding out WHAT, WHEN, WHERE, WHY details about the eclipse (10 min.)

(T) Will provide students a grade on their RAFT writing (At the next class)

Closure

Students will provide a list of the key details (WHAT, WHERE, WHEN, WHY) of the 2024 eclipse in their RAFT writing assignment. (20 min.)

Homework

Students will *complete their RAFT writing assignment by writing a paragraph explaining to a visitor to Moon Shadow Campground what tools they should bring and what safety precautions they should take* due at the next class.

If Time Activities

(T/S) We will discuss the characters in the book and which ones students identified with the most.

Procedural Adaptations/Differentiated Instruction

- For students that are **struggling readers**, additional time will be allotted, and reading help will be given.
- For **ELL students**, they will be provided with an ESL instructor to ensure they are able to read the book in English. ELL students may need translation of unfamiliar astronomy vocabulary, and the teacher will provide an applicable study guide with images.
- For **gifted students**, they will be asked to expand on their research and include additional information in their RAFT brochure.

- **Students with physical needs** will given accommodations and aids as it suits their needs.
- For **students with cognitive needs**, individualized instruction worksheets will be given, and extra help will be offered.
- For **students with behavioral needs**, accommodations will be made to suit their needs, specifically during small group work.

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