Wisconsin Evaluation Collaborative

September 2022

Year 1 Evaluation Report

Galaxy Scouts Comic Book Series

UW-Madison Astronomy Department

Rebecca Cors

WISCONSIN UNIVERSITY OF WISCONSIN-MADISON

Wisconsin Center for Education Research
UNIVERSITY OF WISCONSIN-MADISON

Report Information

About the Author

Rebecca Cors

Rebecca Cors is a Scientist and Evaluator at the Wisconsin Evaluation Collaborative. In 2016, she earned a PhD from the University of Geneva. Questions about this report can be directed to Rebecca via email at rcors@wisc.edu.

About the Wisconsin Evaluation Collaborative

The Wisconsin Evaluation Collaborative (WEC) is housed at the Wisconsin Center for Education Research at the University of Wisconsin-Madison. WEC's team of evaluators supports youth-serving organizations and initiatives through culturally responsive and rigorous program evaluation. Learn more at http://www.wec.wceruw.org.

Executive Summary

The UW-Madison Astronomy Department is developing the Galaxy Scouts comic books series to promote youth excitement about, and engagement with, science. They hired the Wisconsin Evaluation Collaborative (WEC) at UW-Madison's Wisconsin Center for Education Research to support development of the comic books and related outreach programs. With just one comic book published as the first year of the NSF project, which is Academic Year 2021-2022, the comic book team wanted to better understand questions around functionality, understandability, and attractiveness of the comic book. For this reason, evaluation focused on collecting feedback about these topics and, also, ideas for the first activity book, which was in an early phase of development.

A WEC evaluator worked with the comic book team to develop two data collection instruments and a fact sheet about the purpose of evaluation activities. Data collection involved forty-one youth surveys, administered primarily during UW-Madison Space Place programs, and two focus group interviews with educators in the Madison, Wisconsin area. Three evaluation questions (EQs), about understandability, attractiveness, and activity books, guided the evaluation. Feedback collected for each EQ is summarized below on this page and described in detail in the following pages.

Evaluation feedback has been useful for the comic book team, who made some last-minute revisions to the second comic book, whose completion came not long after educator feedback became available. Education advisors on the comic book team have identified some examples and best practices for introducing science phenomena such as 'Bok globules' into the comic books, which are listed in an Appendix: Instructional Models for Science Learning. These instructional models and stakeholder feedback are also informing the development of the activity books.

EQ1. Understandability: Does the target age group follow the comic book text and story?

Educators thought the text and story of the first Galaxy Scouts comic book were most appropriate for upper elementary and middle school youth, depending upon their reading level. To appeal to more middle schoolers, educators suggested making the characters look less 'round' and giving them accessories like notebooks, laptops, etc. Youth could follow the storyline and understand science concepts pretty well. Early data from pilot knowledge questions suggest that some readers may need more support to understand complex, less familiar concepts such as a 'Bok globule.'

EQ2. Attractiveness: Does the comic book best attract and engage middle school youth?

Youth offered mainly positive feedback about the first edition of the Galaxy Scouts comic book. The main characters, Stella and Riley are likable and easy to relate to. The story's action, outer space phenomenon, and graphics are also attractive to youth readers. If anything, some would like the comic book to be longer. Other main suggestions are for more adventures and educational material.

EQ3. Activity Books: What activity book designs would best activate learning about comic book topics?

Educators offered suggestions for the first, in-progress activity book. They provided input about the kinds of activities that would work best with the youth they know, likely settings for using the comic book and activity book, and approaches for developing activity book features and characters.

THIS PAGE WAS LEFT INTENTIONALLY BLANK

Table of Contents

Purpose: Formative, Early Stage Evaluation

The UW-Madison Astronomy Department is developing the Galaxy Scouts comic books series to promote youth excitement about, and engagement with, science. The Wisconsin Evaluation Collaborative (WEC) of UW-Madison's Wisconsin Center for Education Research was hired to evaluate an Astronomy Department program for youth that employed the comic book and activity books, with a focus on examining student science learning outcomes.

At the time of NSF AST award #2108370, September 2021, only the first comic book was published and the program for involving UW student-run programs for youth was still being developed. Evaluation for this program will build from the proposed plans, described in two appendixes: *Appendix: Broader Impacts Activities, Approach* and *Appendix: Guiding Evaluation Questions for Broader Impacts Programming*.

Because the programming was still being developed during the first year of the grant period, the Galaxy Scouts project team wanted to employ evaluation to obtain early, formative feedback about the effectiveness of the comic book from youth and teachers who would use the comic book. More specifically, during the first year of the NSF project, AY 2021-2022, the comic book team wanted to collect stakeholder – youth and educators - feedback about the functionality, understandability, and attractiveness of the comic book. For this reason, evaluation focused eliciting feedback about usability and comprehension and engagement.

The Galaxy Scouts comic book development team wanted to work collaboratively with the WEC evaluator to develop the evaluation approaches. They intended to use the results to improve the comic books and develop the activity books.

Process

Direct feedback from youth readers of Galaxy Scouts comic book, and from teachers of this age group, shed light on how to develop subsequent comic books and activity books.

Evaluation Questions

The following evaluation questions (EQs) guided the evaluation.

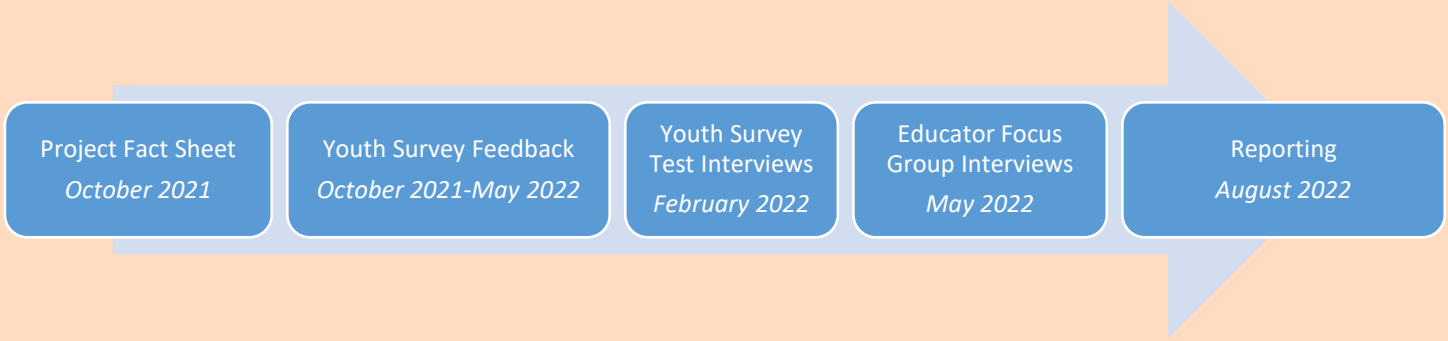
EQ1. Understandability: Does the target age group follow the comic book text and story?

EQ2. Attractiveness: Does the comic book best attract and engage middle school youth?

EQ3. Activity Books: What activity book designs would best activate learning about comic book topics?

Timetable

Evaluation activities took place between October 2021 and May 2022.



Data Collection

Data collected through four evaluation activities was synthesized to produce the feedback in this report.

Activity	Purpose	Sample size
Fact Sheet	To communicate with participants about the program goals and about the purpose and process of evaluation.	na
Youth Survey	To elicit feedback from youth about their comprehension of text, science concepts, and story; what they liked; and what they would like to see more of. After some initial survey feedback, survey testing and improvement took place.	41 youth 2 testers
(2) Educator Focus Groups Interviews	To better understand how the comic book could be most engaging for middle school youth and to elicit ideas for effectively designing activity books.	10 educators

Feedback from Youth and Educators

EQ1: UNDERSTANDABILITY: Does the target age group follow the comic book text and story?

The target age group for the comic book is upper elementary and middle school aged students, ages 9-13. The comic book team wanted feedback about how the text, science concept descriptions, graphics, and story support comprehension by this age group. They also welcomed feedback about other groups.

Age	5	6	7	8	9	10	11	12	13	14	15	16	17
Grade	K	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
					TARGET AGE GROUP*								

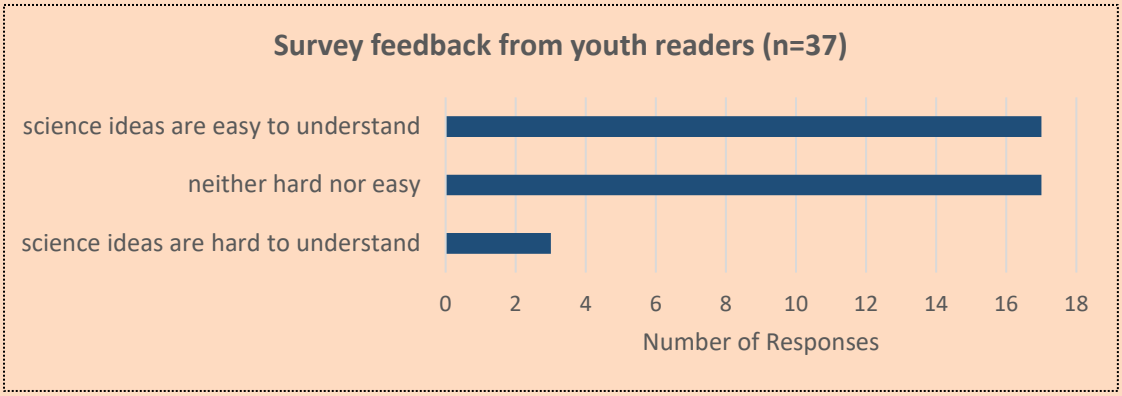
Target Age Group

Educators thought the text and story are most appropriate for upper elementary and middle school youth, depending upon their reading level. However, they explained that younger kids, from mostly upper elementary school and younger grades, would relate to the characters, who look about their age. To appeal to the entire target age group, who will relate more easily to people who are at least their age, educators suggested making the characters look less 'round' and giving them accessories like notebooks, laptops, etc. In addition, they noted that the illustrations would appeal to young kids (4-, 5-year-olds), who can color copies of the comic. *Follows Wisconsin school system.

Comprehension

Evaluation results show that youth could follow the storyline and understand science concepts pretty well.

Youth self-report (survey): Most youth survey respondents thought the science in the comic book was either *easy to understand* or *neither hard nor easy* to understand.



Youth knowledge questions (survey): The comic book team is just beginning to try out some knowledge questions in order to learn about how readers learn about new outer space phenomena. Early data suggested that some readers may need more support to understand the new science concepts featured in the comic books, such as Bok globules.

NOTE: Education advisors on the comic book team have identified some examples and best practices for introducing new phenomena into the comic books. Per request of the comic book team, these resources are in an Appendix: Instructional Models for Science Learning.

EQ2: ATTRACTIVENESS: Does the comic book attract and engage youth?

Feedback from youth provided many specific descriptions of what youth liked in the first comic book and of what they would like to see more of. Educators commented on many aspects of the comic book.

What Youth Liked

Survey respondents liked both Stella and Riley and related most to these characters. They enjoyed the story's action and outer space phenomenon; and thought the graphic detail and colors were attractive and realistic.

Characters (n=21)
About half of the survey respondents wrote something about their favorite character in the comic book. Seven indicated that Stella was their favorite. A few respondents wrote that they liked how realistic the characters are. Other characters that received one or two votes were Curiosity, the tour guide, Riley, the main teacher (when they were scolding the main characters), and Mr. Halley (these responses referred to Mr. Halley as "that creepy old guy" and the "evil scientist."). See Appendix: Directions and Opportunities to learn what the comic book team is doing to adjust the image of Mr. Halley.

Story (n=14)
- About one-third of respondents wrote about which parts of the comic book story they liked best. About half of these responses were about some kind of action. Several mentioned traveling to outer space or another planet. Others described adventure, encounters, conflict, and feeling curious about what comes next. Similarly, the youth who tested the comic book survey said they liked reading it because of the action of getting "zapped into space."
- A handful of comments mentioned some objects in outer space: "dark matter" and planets Saturn and Mars.
- Another handful of comments used adjectives to describe their view: "cool," "fun," "interesting," and "because that was cool."

Graphics (n=18)
About half of the survey respondents wrote something about why the graphics appealed to them.
- Most of these comments were about the design, describing "pictures of space," colors and details, and the front cover art as aspects they liked.
- A few offered general comments about liking the style and how things are drawn.
- A few commented on how realistic the graphics were; one liked the facial expressions.

Which of the characters reminds you of yourself or your friends? (n=5)
A revision to the survey, before the last six respondents completed it, included a question about which characters in the comic book reminded the respondents of themselves. Five respondents offered responses. Three identified with Stella, commenting about how they look like Stella or how Stella is like their friend. Two identified more with Riley, with one commenting that "he reminds me of my brother."

"Stella is like my friend."

"{Riley} reminds me of my brother."

Youth Suggestions

When asked about suggestions to improve the comic book, about one-quarter of youth survey respondents wrote about how they liked the comic book. Some participants indicated that they would like to read a longer comic book. Similarly, the two youths who tested the survey said they liked the comic book and, if they would change anything, they would make the comic book longer. Specific requests from a few respondents were for more educational content, more details about adventures, adding some characters or space phenomena, and including a "zoom-out" that shows where they are in space.

Youth Suggestion Theme	Feedback
Good as is (n=12)	Almost half of the respondents indicated they had no suggestions, because the comic book was already very good, and enjoyable. One response praising the quality also indicated it seemed better for a younger age group. *"How good the illustrations and story (were) made me want to read more."*
More of… (n=12)	– Several respondents wanted the comic book to be longer. – Several respondents wanted more facts, and more educational content. – Several wanted more (details about) adventures. – Other (single) requests were for more detailed pictures, character diversity, "planets and stuff," and jokes. *"It would have been more interesting if it was longer but other than that it was really good."* *"Probably if it had more facts in it. I feel like it could be more educational."*
Add (n=10)	– Suggestions to add or change something each came from just one respondent. These individual suggestions: monsters, black holes, animals (a dog, cat, and snake), and a "cliffhanger" having to do with NASA and the ISS. – One idea was to show a "zoom out," so they could get an idea of where the story took place.

Educator Feedback

Educators had many positive things to say about the comic book graphics, text, story, characters, and the way the comic reflects Wisconsin's diverse culture. They also made some suggestions. Their input fell into several categories: Graphics, Text, Story and characters, and Diversity-Equity-Inclusion (DEI).

Educator Input Theme	Feedback
Overall	Enthusiasm *"Awesome ideas to help teachers get kids engaged."*
Graphics	– Colorful; art is great; great representations of science. – Excellent connectivity to story.
Text	– The language level was fine. – A number of language bubbles that contained a lot of text. Less text density could feel less dense and burdensome to kids. – What about having a glossary? For terms like 'coelostat.'
Story and characters	Story: – Beginning the story with the chaos of a field trip is effective, because it relates to youth experience. – Stella poses many questions that are not answered. Could follow-up come in the activity book? Characters: – Illustrations of a female teacher are confusing. Is she pregnant? – Stella and Riley have a good chance of being popular characters who remain 'stars:' banter (conversation) between them flows and brings in personalities of a nerd and troublemaker, a person of color and female. – If Stella and Riley become less popular, bring in new characters or make science more central. – Dazzle of monsters and aliens could distract from an already good story. – Introducing Bok globule is new and interesting. – Science is cleverly integrated into plot. – Include longer scientific discussions between Stella and Riley? – Be careful when introducing jargon and science terminology. – Be aware that some kids will examine the comics closely, e.g., students of one participating educator found what looked like a hole in space suit, which may seem unrealistic. *Breadth vs depth* – Comic book seems like it has two stories in it – kind of broad. – Consider two comic books with more depth: one on Mars and the other about Bok globules. – As is, the story moves around a lot and feels less focused.

DEI (Diversity, Equity, Inclusion)	– The comic books would support classroom discussions about equity, in part because Stella is a girl of color.
	– Mr. Halley is a middle-aged white man wearing a white lab coat; his gender, race, and dress are all stereotypical of scientists, to whom not all youth can relate.
	– Great how diverse class group is shown: e.g., Muslim child on the field trip.
	– Possible triggers to avoid;
	  o On page 3, a Black boy throws something, showing him as the troublemaker. This might trigger some tensions about diversity.
	  o The example ISS (International Space Station) activity book has an exercise where Columbus is honored – this would offend Native Americans.

EQ3: What activity book designs would best activate learning about comic book topics?

Educators offered suggestions for the yet-to-be-produced Galaxy Scouts activity books. They provided input about the kinds of activities that would work best with the youth they know, likely settings for using the comic book and activity book, and approaches for developing activity book features and characters.

Activity Book Idea Theme	Feedback
Kinds of activities	– Offer several different levels of difficulty and types of activity to draw more kids: some math, some coloring, some hands-on activities, etc. – Give kids challenges: everything from fixing a kink in their air hose to code-breaking (cryptography). – Consider including a scavenger hunt element, which could combine with local telescopes or Madison's UW Space Place, like national parks or NatureNet. – Get kids to learn and interact with science topics from the comic book. – Design activities that are useful for teachers. – Design activities one can do at home with simple equipment. – Design activities that are useful for assessing learning. – Connect to other areas of science, like the ISS activity book connects to insects. – Depict the process of science, the work of thinking about and testing problems. – NOTE: Some educators liked Naked Eye Astronomy for online videos.
Settings for using the comic book and activity book	– Science classroom – Afterschool – Book club – Event – Intergenerational (family) reading
Features and characters	– Consider: QR codes that lead to activities, stickers that show Galaxy Scouts characters, and coloring activities for younger ages. – Link to creative ideas like Science to Street that featured sidewalk art at the UW Discovery Building.

References

AAAS. "Middle Grades Science Textbooks: A Benchmarks-Based Evaluation." AAAS Project 2061 Analysis Procedure page. http://www.project2061.org/publications/textbook/mgsci/report/analysis.htm accessed on August 15, 2022. Copyright 2002 by the American Association for the Advancement of Science. All rights reserved.

Cors, R., and Bell, C., 2022, April 21, Retrospective pre-posttests are ideal for evaluating many informal learning experiences. Center for the Advancement of Informal Science Education (CAISE), informalscience.org. https://www.informalscience.org/news-views/retrospective-pre-posttests-are-ideal-evaluating-many-informal-learning-experiences.

Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods* (4rd Edition Ed.). Thousand Oaks, California: Sage Publications.

Simon. Judy S. (1999). *Conducting Successful Focus Groups. How to Get the Information You Need to Make Smart Decisions*. Amherst H. Wilder Foundation, St Paul, MN, USA.

Teachermade. "Research-Based Guidelines For Evaluating Worksheets." https://teachermade.com/worksheets/ accessed on August 15, 2022. Copyright 2002 by Teachermade. All rights reserved.

Appendix: Directions and Opportunities

Improvements based on evaluation feedback

Feedback from the year one evaluation was available in time to make adjustments to the second comic book. Some of the main adjustments are listed here.

- Adjusted outfits and shape of youth to look a bit older.
    - Added skateboards and mobile phones.
    - Faces of youth are a bit thinner and less round.
- Mr. Halley is wearing a sweater; exploring other ways to make him more approachable in future comic books.
- Made some details match a more modern look, so youth can relate to them.

Directions for evaluation

Based on the phase of comic book development, the evaluation will focus on the following for year 2.

- Work with the comic book team to determine which science education methods can support comic book development (see examples in Appendix: Instructional Models).
- Evaluate activity books by working with the comic book team and educators to define evaluation criteria. Criteria could include:
    - Based on the Year 1 Astro Ed Evaluation, pay attention to:
        - Reading level,
        - Goals of each activity,
        - Alignment with Wisconsin classroom standards for science teaching and learning,
        - The entire book's balance of levels of difficulty among activities; some activities should challenge youth,
        - Usefulness of activity book in the classroom and workshops,
        - Accessible in that they are easy to do at home with inexpensive equipment,
        - Relatedness to Galaxy Scouts comic book science topics,
        - Attempts to relate to other sciences (e.g., biology, sending a plant into space),
        - Depiction of process of science, i.e., the work of thinking about and testing problems.
    - According to researchers and educators focusing on evaluating science textbooks and worksheets for middle schoolers, effective science learning materials are:
        1) At appropriate reading level,
        2) Provide a sense of purpose,
        3) Use formatting to guide learners,
        4) Relate to what learners already know,
        5) Engage learners with comic book science concepts,
        6) Enable students to feel rewarded, and 6) enable students to feel challenged.
- Evaluate youth outcomes from participating in workshops where they use the activity book.

Programmatic Needs/ Opportunities

Evaluation feedback points to the need for the following comic book development directions and related outreach activities.

- Work with educators to develop activities for activity books (for different reading levels).
- Send the comic book team to a training program about science storytelling techniques.
- Better understand how comic book stories can align with teacher goals for classroom teaching, including standards for science teaching and learning.
- Involve the South Park St communities in developing comic books, including Madison Public Library-Goodman South, the Boys and Girls Club, and others.
- Activate outreach through the Wisconsin Book Festival.
- Activate outreach to smaller communities outside Madison in Wisconsin, perhaps along with UW-Astronomy programs that go outside Madison, such as *Universe in the Park*.

Appendix: Broader Impacts Activities and Logic Model

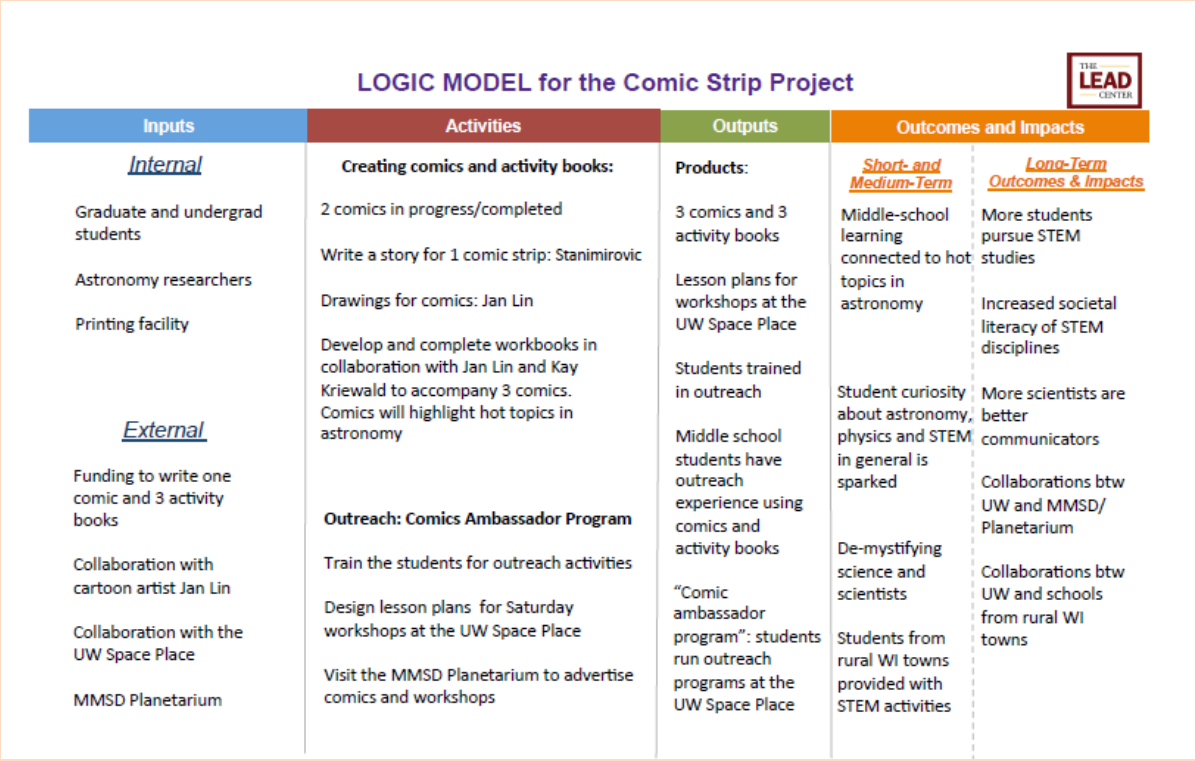
The NSF-proposed broader impact activities are listed below, along with a logic model that describes its theory of action. Once a Galaxy Scouts activity book has been produced, the evaluation will focus on the intervention described below.

The Broader Impacts strategy is to promote youth interest in science topics through these activities:

(a) An early-education intervention using an interesting, age-appropriate comic strip.

(b) Creation of the comics' Ambassador Program, which will train undergraduate and graduate students to lead workshops for middle schoolers that will be designed to encourage curiosity about astronomy and astrophysics, and demystify the image of these scientists, through 'hot,' current topics in astronomy.

A logic model illustrates the team's theory of action



LOGIC MODEL for the Comic Strip Project

Inputs	Activities	Outputs	Outcomes and Impacts	
			Short- and Medium-Term	Long-Term Outcomes & Impacts
Internal Graduate and undergrad students Astronomy researchers Printing facility *External* Funding to write one comic and 3 activity books Collaboration with cartoon artist Jan Lin Collaboration with the UW Space Place MMSD Planetarium	**Creating comics and activity books:** 2 comics in progress/completed Write a story for 1 comic strip: Stanimirovic Drawings for comics: Jan Lin Develop and complete workbooks in collaboration with Jan Lin and Kay Kriewald to accompany 3 comics. Comics will highlight hot topics in astronomy **Outreach: Comics Ambassador Program** Train the students for outreach activities Design lesson plans for Saturday workshops at the UW Space Place Visit the MMSD Planetarium to advertise comics and workshops	**Products**: 3 comics and 3 activity books Lesson plans for workshops at the UW Space Place Students trained in outreach Middle school students have outreach experience using comics and activity books "Comic ambassador program": students run outreach programs at the UW Space Place	Middle-school learning connected to hot topics in astronomy Student curiosity about astronomy, physics and STEM in general is sparked De-mystifying science and scientists Students from rural WI towns provided with STEM activities	More students pursue STEM studies Increased societal literacy of STEM disciplines More scientists are better communicators Collaborations btw UW and MMSD/ Planetarium Collaborations btw UW and schools from rural WI towns

Appendix: Guiding Evaluation Questions for Broader Impacts Programming

Guiding questions for systematic evaluation

(EQ1) Alignment. Is there alignment among the theoretical/logical frameworks of the project, its goals, its activities, and intended science learning outcomes?

(EQ2) Outcomes and Impacts. What is the impact of activities (use of comics and activity books) on the target group(s) (youth, educators, …project partners)?

(EQ3) Sustainability. How can products (comics, activity books, trained workshop leaders) support science astronomy education in Wisconsin in an ongoing way?

Description of and methods for examining each evaluation question

(EQ1) Alignment	-*Track alignment* of the team's plan, project goals, activities, and outcomes. -Methods: Refine the evaluation plan (logic model) and provide regular feedback about alignment.
(EQ2) Outcomes & Impacts	-*Track youth outcomes* (feedback and takeaways) from comics and activity books. -*Understand the usefulness* of comic books for educators. -*Track the effects of the comic ambassador outreach program* on youth outcomes. -Methods: surveys, including focus groups, think-aloud, and individual interviews, and also rapid data collection such as post-it polls
(EQ3) Sustainability	-*Explore the operations and effectiveness* of the ambassador outreach program. -*Identify possibilities for continued operation* (after grant funding). -Methods: use tools for observations, interviews, and surveys.

Appendix: Instructional Models for Science Learning

Instructions models for effective teaching and for storytelling for science learning, as well as the 5E instructional model for teaching about science could inform storytelling in Galaxy Scouts comic books.

Effective Teaching

The practical guide for effective teaching points out how there are a few essential steps, listed below, for an educational lecture to be successful. As a one-way communication, like lecturing, the Galaxy Scouts comic book could consider this structure when developing stories.

1. State the main points of the lecture (learning objectives) at the beginning.
2. Introduce a main organizing idea or theme.
3. Use examples to illustrate each idea.
4. Use repetition to reinforce the main points.
5. Summarize and refer back to the main organizing idea.

Storytelling for Science Learning

Because the primary story author is leaving the team, and because the comic book team is always looking for good ideas for constructing great stories that engage and support learning, here are some resources about storytelling for science learning. Also worth considering is how teachers look for materials that meet science learning standards.

- Storytelling in science class by Edutopia: https://www.edutopia.org/article/dragons-and-fairy-tales-science-class .
- Examples of stories to use to teach specific science concepts from the University of Texas: https://academicpartnerships.uta.edu/articles/education/teaching-science-with-stories.aspx .
- Example of teaching chemistry through a story that aligns with National Science Education Standards (NSES): https://files.eric.ed.gov/fulltext/EJ1228451.pdf .
- Example of a science instruction book: https://openstax.org/details/books/astronomy .

5E Science Instruction Model

The 5E instructional model for teaching about science is what educators follow to engage students' curiosity and to lead them through an inquiry approach to science.

What is it? The 5E instructional model is an inquiry approach that encourages students to engage their curiosity to ask questions, explore solutions to socio-scientific issues, use evidence-based explanations to justify their reasoning, elaborate on possible effects, evaluate their findings, and predict potential outcomes based on different variables. To follow the model, learner go through five steps: Engage, Explore, Explain, Elaborate, and Evaluate).

Apply it The table below describes student roles for each learning phase and provides example comic book text.

Learning Phase	Student's Roles	Example Comic Book Text
Engage/Excite	Students are introduced to the concept. Students make connections to prior knowledge. Student thinking is clarified. Students become mentally engaged in the new learning experience.	Stella: What is that? It's so vast. New things make me nervous! Riley: If it feels new, what can you see that connects to something you already know? If you would compare that to an asteroid, it has more xx but is just as xx…
Explore	Students explore or experiment at this point. They engage in observations, use science tools and materials (manipulatives), collect data, and record data.	Stella: Wait! Remember how Mr. X said to collect data. You know, facts. Like, for one, its color and the timing of its expansion. Do you have a watch? Riley: It looks like last night's spaghetti after my brother threw it up! But seriously, Observations are best by xxx…
Explain	Students verbalize their understandings from the "explore" phase, look for patterns in their data, and describe what they observed. This can be done in small and/or whole groups.	Riley: Look Stella, our data show that every three minutes we see xxx movement… Stella: Cool! Through observations, I've noticed that the color changes at three-minute intervals also!
Extend	Students expand their learning, practice skills and behaviors, and make connections or applications to related concepts and the world around them.	Mr. Haley: Here is a report about the xxx that you have been observing. How does it match what you have been seeing? These xxx are not all the same. Try looking at this xxx. Based on what you've been noticing, what do you think will happen next?
Evaluate	Students answer questions, pose questions, and illustrate their knowledge (understandings) and skills (abilities).	Stella: Hey Riley, do you remember what that report showed about xxx? Riley: Sure, it said xxx. It makes sense when you look at how we observed xxx. What I want to know is how to use this telescope. Can you help?

Appendix: Fact Sheet

Information about the Galaxy Scouts Comic Book Series

May 2022

WHO ARE WE?

We are a team of scientists, artists, and educators from the University of Wisconsin, Madison. You can find more about our science education and Galaxy Scouts comic book series at http://www.astro.wisc.edu/comic/. This project was funded by the Research Corporation for Science Advancement, the National Science Foundation, and the UW Baldwin fund.

- Our overarching goal is to improve societal literacy about STEM (Science, Technology, Engineering, Math) disciplines.
- We want to share the excitement and importance of STEM discoveries and questions with youth.
- Making science accessible to all people and inviting them to consider themselves as potential scientists are core goals.
- To do that, we are developing comic strips about the space adventures of Stella and Riley that involve cutting-edge STEM topics to engage young students in science learning and discovery. In the future, we plan to develop activity books to accompany each comic book.

WHY ARE WE PRODUCING THESE COMIC BOOKS?

Studies have shown that introducing scientific concepts in an interesting, age-appropriate way is essential to spark students' interest in science and promote long-term engagement with science. Elementary and middle school, when many young people identify their core interests and abilities, is a prime time to encourage youth interest in STEM areas. We want to demystify science and break down common stereotypes used in many layers of society by:

- Featuring innovators and scientists from diverse backgrounds, offering role models for all young people.
- Emphasizing the importance and beauty of scientific discovery through a variety of 'windows,' such as solving problems, helping others, teamwork, being curious, and exploring the unknown.
- Presenting materials appropriate for various age levels.

WHY ARE WE ASKING FOR YOUR IDEAS?

We need your feedback to understand how to formulate stories that will be interesting and inspiring to all people, especially middle school-aged youth. We want to:

- Show how science is part of our everyday lives and, sometimes, our careers.
- Create comic characters and adventures that are interesting and enjoyable to read about.
- Make science explanations clear and simple so that everyone can understand.

HOW WILL WE USE THE INFORMATION FROM THE EVALUATION? WHO WILL BENEFIT?

Your responses will help us understand your experiences with the comic strip. This will enable us to improve how fun and interesting the comic book stories are and make the presentation of the characters and scientific ideas more accessible for everyone. You will not benefit directly from participating in the evaluation. However, constructive feedback will lead to a better quality of future comic strips, which you and others may read.

If you have any comments or questions about the project, please contact Professor Snezana Stanimirovic, sstanimi@astro.wisc.edu