Literacy After the Dome

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BIOGRAPHIES
Jack has been the planetarium director at a middle school planetarium for 15 years in Omaha, Nebraska in the United States. He has since opened his own portable planetarium in his home state of Iowa.

ABSTRACT
Applying literacy strategies to the post planetarium experience can extend a students retention of content learned in the planetarium. Reference style books are not the only option for these students as fiction, graphic novel, and art books are also successful. The strategies are designed with scaffolding to support students who have reading difficulties and experience language barriers. Use of literacy strategies can improve the application of vocabulary and synthesis of process or systems from the planetarium presentation. The use of literacy strategies can also assist the students in developing informed questions that can be used in the inquiry process.

INTRODUCTION
As planetarians we are leaders in astronomy and science education however there are times where we must also become instructional leaders. Schools, teachers, students, and families visit your planetarium and for 45 minutes to an hour you are in control of the instruction but what happens when they leave. While some master teachers are able to integrate astronomy concepts into their instruction in the classroom there are times when additional information and scaffolding are useful.

I. SECTION 1
A very useful strategy that many teachers are aware of either formally or informally is Six Step Vocabulary. It is very powerful in assisting the students in mastering new vocabulary terms that are introduced in the planetarium.
I.1 Sub-Section 1 In the Dome

Three of the six steps can be done in the planetarium very successfully. These steps are Example, Restate, Pictures

- **Example**
  - Provide the students with a description, explanation, and examples of terms. Use everyday vocabulary and avoid dictionary definitions.

- **Restate**
  - In a planetarium this can get noisy, for this step have the students see if they can come up with a better definition to share with the group.

- **Pictures**
  - This step is very easy in the planetarium, use the power of the planetarium’s immersive environment.

I.2 Sub-Section 2 In the Classroom

The second set of three steps that can be done back in the classroom are; Activities, Discussion, and Synthesize

- **Activities**
  - This is where a teacher’s tool box of instruction is really useful. This is when they an look for analogies, metaphors, affixes, synonyms, and antonyms. Students get to have repeated exposures to the vocabulary words or topics to help move information into long term memory.

- **Discussion**
  - This is the time where you are seeking deeper knowledge by having the students completing a think/pair/share with the information and Socratic Seminar

- **Synthesize**
  - This is the time were you are really showing off what you know. Students will take the vocabulary, topic, and concept to create something, This could be a board game, story, comic book, poster, song, or model.

II. Section 2

Reciprocal teaching is a powerful way to have students develop a deeper understanding of a topic using five major attributes.

- Clarify
- Predict
- Question
- Summarize
- Visualization

Let’s take a look at using this while studying the planets of the solar system. Like before it will be broken into roles for in the planetarium and in classroom. When used in a single environment you can move between any of the attributes visiting any one of them as many times as needed.

II.1 Sub-Section 1 In the Planetarium

In the planetarium, don’t outright say a definition of what is a planet. Instead couch it as a tour around the solar system. After visiting Mercury, Venus, and Earth most students will Predict that Mars is also spherical. During the visits to the Outer planets the students will start to Clarify this idea and add the option that they can have rings and many have moons. Use Socratic questioning strategies to pose open-ended questions to the students like, “What do they have in common?” “Is there a pattern?” and “How are they unique?” These are good starter questions to lead the students to asking their own questions like “Are some moons the size of planets?”

II.2 Sub-Section 2 In the Classroom

After returning to the classroom the students are tasked with Summarizing a definition of “what is required to call something a planet?” They can also create a diagram or a poster to support their definition as part of Visualization. I generally send a sealed envelope back with the teacher with a proper definition of what is a planet since many textbooks use definitions that are very generalized and do not work well for in depth instruction.

III. Section 3
The final technique to be covered is RAFT writing. Let’s take a look at this continuing to use the solar system as a topic. After a visit to the planetarium the students use the RAFT as a scaffold to write a story.

- **R** - Role - Astronaut
- **A** - Audience - Their grade level
- **F** - Format - Short Story or Graphic Novel
- **T** - Topic - The first Astronaut to visit __________

The students get to choose one of the planets in the solar system to send their astronaut selves to and document the mission as a short story or graphic novel.

Other examples on a different topic
- A letter home to the ocean from a rain drop on an adventure through the water cycle.
- A diary entry for a star in a globular cluster about having thousands of stars nearby.

ACKNOWLEDGMENTS

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