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ONLINE EXTRA

The Magic School Bus and Beyond Considering the potential of hybrid texts in the elementary science classroom

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As Mrs. Taylor sits preparing her lesson on weather, she looks through texts in her classroom library that can supplement hands-on experiments her students will conduct. She has quite a few informational texts with headings, graphs, and charts that address different types of weather, but she really wants to incorporate *The Magic School Bus: Inside a Hurricane* (Cole 1996) into the unit. However, some of her colleagues have been discussing that stories such as this don't really help students learn science content. Perhaps she should just leave the book in the classroom library so if students want to, they can look through it at leisure.

While hybrid texts include information, the reader encounters the information through a story type narration (Maloch and Bomer 2013). Although we know that quality informational text can be valuable in the science classroom, many teachers are left wondering what if any role hybrid texts should play in science lessons. Table 1 contains examples of hybrid texts which tie to scientific concepts. In this article, I discuss the value of hybrid texts and present specific activities that can be used with hybrid texts in elementary science classrooms.

Table 1. Examples of scientific topics and hybrid texts.

Scientific Topic	Hybrid Text
The water cycle	<i>A Drop Around the World</i> by Barbara Shaw McKinney
Spiders	<i>The Tarantula Scientist</i> by Sy Montgomery
History of space exploration	<i>Look to the Stars</i> by Buzz Aldrin
The story of an invention	<i>The Secret Subway</i> by Shana Corey

The formation of mountains *The Sun, the Wind, and the Rain* by Lisa Westberg Peters

A Closer Look at Hybrid Texts

Hybrid texts are referred to by many names in the professional literature including fiction, informational narratives, and blended texts. According to Bintz and Ciecierski (2017), elementary students often find hybrid texts appealing. Sharing information through a narrative format is familiar to students, and many young students grow up watching *Sid the Science Kid*, *The Wild Kratts*, and *Magic School Bus* videos. It is easy for students interested in a science topic to be exposed to a variety of hybrid texts even outside the classroom setting.

However, some researchers (Golke, Hagen, and Wittwer 2019) find that students show less content understanding when they read hybrid texts than when they read informational text. Students remember the fictitious story but don't remember the information imbedded in the stories. In fact, while third and fourth-grade students read just as accurately and at the same rate regardless of text type, they had much more difficulty answering questions about what they read in hybrid texts (Cervetti et al. 2009). With science lessons seeking to deepen scientific knowledge, this is critical.

Using Hybrid Texts to Supplement Informational Texts

When working to develop scientific knowledge, both informational and hybrid texts can have a place in lessons. Through exposure to a variety of text types, students will understand how diverse texts are designed to convey information. The more texts students read, the more general information they can gain about the world around them.

Akerson et al. (2011) emphasize the importance of quality children's literature being used with science, but it isn't just educational researchers who encourage the use of both hybrid and informational texts during science lessons. Educational organizations such as NSTA encourage the use of varied texts when teaching content area material. However, teachers need to know how to talk about hybrid texts and incorporate them into their lessons so that students engage with the science information within the pages and learn from the texts.

Understanding How Readers Approach Text

Golke, Hagen, and Wittwer (2019) believe that readers approach hybrid text by activating a different mindset when they read it. That may explain in part why some students do not monitor their comprehension of content they are encountering in hybrid texts. Readers read *aesthetically*, to become in-

volved in the story world, or *efferently*, to take away information (Rosenblatt 1994). Of course, the two approaches are not isolated but rather represent endpoints on a continuum. Therefore, students must understand how the type of text they read may affect the approach they take and the scientific information they remember.

When students engage with texts such as hybrid, it is important to ensure that students are aware of their approach, or stance (Rosenblatt 1994), so that they gain a better understanding of a topic. They must not only read to become part of the story experience but also to take away information.

The following suggestions enable elementary students to get the most from hybrid texts. The ideas can be modified to meet the needs and backgrounds of the students at various grade levels. Each of the suggested activities is described in detail.

Think-Alouds

A Think-aloud is a great way to make thinking visible to students. Given students' need to understand how their stance changes while reading a hybrid text, a think-aloud can be a worthwhile activity. For example, students may enjoy *A Drop Around the World* (McKinney 1998), but it is a complex hybrid text. Introduce the text and show the cover. Then ask students what they expect the text to be about and what on the cover gives them clues. Now begin reading the story aloud.

There is something unusual about this text. On the first two pages of the story, there is a sketch of a cloud, raindrop, wavy lines (vanishing vapor), or a hot air balloon next to each stanza. Ask what role these symbols might have in the text. Where might we look in the text to see if the tiny drawings are explained?

If students don't suggest it, remind them that the front matter in the text was not read. As you turn back to the previous page, there is a box containing information across from the copyright date. Read the information. The author states that there are symbols that the reader should keep track of in the text.

Ask students if there is other information in the rectangle about the text. Within the rectangle, the author informs the reader that there is a raindrop with a face hidden on each page. Will the symbols or the raindrops provide scientific information? Why do they think the author hid the raindrop?

Finding the hidden raindrop sounds like fun, but ask students if looking for the raindrop while the text is read will hinder remembering information in the book. If students do not think it is an issue, ask them to look for the raindrop while the next page is read. Then ask them questions on the information in the text. Was it difficult to remember the information that was read? Read the page again while students focus on the text. Was it easier to remember information when students were focusing on the information in the text?



As a class, brainstorm ways to find the raindrops in the text without losing meaning. Perhaps the first time the story is read, ignore the raindrop or maybe skim through each page and find the raindrop before reading for meaning. To gain information from text, it is important to focus attention on the purpose for reading.

At the end of the book there is a section explaining each symbol and scientific content related to the symbol. The reader can learn the different forms of water that exist on Earth and why that may be different on other planets. They can learn why the water weight varies from deep in the ocean to the surface, how water bends light, and a great deal of other information. The background knowledge of the students will impact the degree of detail shared.

Making students aware of the purpose of hybrid texts and the importance of taking away information is the first step in helping students to navigate the texts. A think-aloud emphasizes the importance of asking questions as text is read and thinking about what is important to focus on while reading.

T-Charts

Students need to be aware that hybrid can differ from informational text in both content and in format. Consider having the class complete a t-chart. After sharing a portion of a hybrid text, students can list scientific facts they find in the text on one side of the t-chart and fictional elements of the story on the other (Table 2). By doing this, teachers are reinforcing the idea that hybrid text contains fact and fiction, and it is important to pay attention and think about when the author is writing to draw the reader into the story or to provide information related to the topic. Once students can complete a t-chart on a hybrid text, they are ready to look at diverse texts.

Table 2. A t-chart for *The Magic School Bus: Inside a Hurricane* (Cole 1995).

Science Facts	Fiction
Warm air rises.	There are characters such as Mrs. Frizzle and Arnold.
Vocabulary: <i>condense</i> , <i>expand</i> , <i>molecules</i>	Bus turns into balloon. The characters talk to each other.
Clouds: cirrus, stratus, cumulus	Tornado picks characters up and puts them on the bus.



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For a more complex t-chart, students may compare the content and format of an informational and

hybrid text on the same topic, such as *The Magic School Bus Inside a Hurricane* (Cole 1995) and *What are Hurricanes?* (Schuh 2019); see Table 3. The *Magic School Bus* text is told primarily through dialogue and visuals, whereas the informational text on hurricanes includes individual factual statements. In addition, the informational text has a glossary, index, and a list of internet sites.

Table 3. T-chart comparing a hybrid and informational text on the topic of hurricanes.

<i>The Magic School Bus: Inside a Hurricane</i> (Cole 1995)	<i>What are Hurricanes?</i> (Schuh 2019)
Characters talk to each other.	There is no dialogue (talking).
There is a story about a magic bus.	There is no story. Just facts are stated in it.
The images look like cartoon drawings.	There are diagrams and photographs
You have to read the story and look. There is a glossary, index and table of at everything on the page to find facts.	contents to point out important facts.

For students who struggle with comparing two diverse types of text such as hybrid and informational text, initially have the students focus on only format in the texts. Students may even have a list of text features they can refer to to see if any of the features are in the texts they are examining. Once students are successful with examining format, they can move on to look at content. If students are experiencing difficulty with this activity, a think-aloud may scaffold students to show them how to examine the texts. Realizing texts are not all created in the same way and that readers need to approach texts flexibly is a valuable skill to develop as students continue to experience more complex text and scientific information.

Where Are You on the Continuum?

It is important to ask students to think about how they are reading. Are they reading to take away information from the text, or are they reading more for enjoyment and to feel part of the story experience? Read a short passage of a text to the class. Stop at specific points and have students where they are on a stance line (Figure 1).



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Where are you on this stance line? Mark with an X where you would put yourself on the line for the selected piece of text. Then answer the question below and be prepared to share with your classmates.

Reading to be Part of
the Story Experience

Reading to Remember
Information

What made you choose to mark your place where you did on the line?

Figure 1. Stance Line

Younger students may physically stand on a taped stance line on the floor or hold up a brightly colored card when the reader stops at various points in the text. One card can be for story experience and one can be for reading for information. Students can then explain why they choose to stand at that specific place on the line or hold up a particular card.

Another idea is to give small groups of students a hybrid text from one specific series, such as *The Magic School Bus Series*. Have each group put a sticky note marked SE (Story Experience) for a place in the text where they would put themselves on the far left of the line and another place in the text with an RI (Remember Information) where they would be on the far right of the line. Have them share their two pieces of text with the rest of the class to see how others react to the same lines in the text.

Whether a group is looking at Joanna Cole's *The Magic School Bus Inside the Human Body* (1989), *The Magic School Bus in the Time of the Dinosaurs* (1994) or *The Magic School Bus inside a Hurricane* (1995), students will notice similarities in the way information is presented by the author. Thought bubbles contain humorous comments but rarely if ever scientific information. In contrast, sheets of notebook paper that are in Cole's illustrations contain scientific information related to the book topic.

For students who are not seeing connections between texts, have them locate three to five pieces of information they believe the author wants to convey on a page. They can put a sticky note at the point on the page where the information occurs. Where is the information? Is it in thought bubbles, maps, or notebook paper visible in the illustrations? Just as authors have a writing style, there are patterns that Cole uses in her books to convey information.

Students need to realize that whether they are reading to take away information or to enjoy the story, their stance will change as they read a hybrid text. Taking the appropriate stance and understanding when they are reading important information is key to strengthening their scientific understanding while reading hybrid texts.

Talking Drawings

The strategy "talking drawings" (McConnell 1993) allows students to expand their vocabulary, demonstrate content knowledge, and see misconceptions they may have on a topic (Cappello and Walker 2020). Also, it is a great way for students to see how much information they have learned.

Before starting a science unit, ask students to show what they know about the topic through a drawing they create. A kindergarten teacher includes this activity with a unit on hatching eggs. At the beginning of the unit, students draw a picture showing what they know about eggs hatching.



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along with having students watch eggs hatch. she incorporates texts such as *What's in That Egg?*

Along with having students watch *Egg Watch*, she incorporates texts such as *Watch It! That Egg* (Baines 2009) and *See How They Grow: Chicks* (Royston 2007) into her lessons. As the students listen to the texts, they again draw pictures and add labels to their illustrations. The young students can see how their knowledge deepens from the beginning to the end of the unit.

It may be easiest to initially use this strategy with informational science texts. They serve as a scaffold to introduce the idea of gaining and recording information in a text through drawing. Once students demonstrate the ability to gain and share information from an informational text through a drawing, talking drawings can help even the youngest students to recognize and retain the information in hybrid texts.

Students may use labels on their drawing to show key vocabulary, label parts, or list facts. Talk about their drawings. Did students gain information from the text they read or heard? If not, is it due to the way they approached the text? Could they read the text again differently and gain more information to include in their drawing?

Initially, young students, or those with less experience using drawing to convey information, may put minimal information in their second drawing. If students have difficulty with this activity, model for a small group how to read and gain information from a text while creating a picture on a whiteboard. Allow these students to hear the text again and have them stop the reader when they think there is information to add to their drawing.

The goal isn't the finished product but rather the process students are using to gain information and reinforce the information through the modality of drawing. Students will show growth with experience.

Be an Author

Students need to see themselves as authors of diverse texts. The easiest way to begin is by having students create an informational text on a science topic they are studying. How will they convey the information? Which text features commonly found in informational text such as headings, fonts, and charts will they use? It is typically easier to create an informational text than a hybrid text because with hybrid texts students need to not only incorporate information but also weave an engaging story around the information.

Once students can create an informational text, they are ready to create a hybrid text. Encourage them to think about the text they plan to create. What type of story will they create? What type of images do they plan to include?

Consider sharing excellent hybrid science texts that organize information in very different ways. *The Sun, the Wind, and the Rain* (Peters 1988) has a parallel plot throughout the text. On the

side of the page, Elizabeth, the main character, gradually creates a mountain of sand with her bucket



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side of the page, Elizabeth, the main character, gradually creates a mountain of sand with her bucket at the beach. The second text, *The Secret Subway* (Corey 2016), uses a very different style to detail the invention of the subway. The fictional narrative explains how and why the first subway was invented. At the end of the story, there is an author's note detailing additional information about the invention. In addition, the author includes a bibliography and internet sources.

There is no right or wrong way for students to create their texts, but to gain the most from text, students need to be thinking about hybrid and informational science texts and how they differ. Through this activity, students have an opportunity to think like an author and to think of different ways they might convey information in a hybrid text.

Conclusion

Students need to understand the power of texts. They need to realize the enjoyment and scientific understanding they can gain from them. For this to occur, students need purposeful exposure to all types of texts in science. Through the intentional use of hybrid and informational text during science lessons, we not only strengthen scientific knowledge but enable students to become engaged readers who can get the greatest benefit from diverse types of texts. Text flexibility is key because it broadens students' text schema so that they can effectively approach future texts they will encounter (Altieri 2016). The strategies described in this article are meant to serve a starting point. Through collaboration and discussion with colleagues, other new ideas will emerge that enable students to further understand the power of text.

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