Q&A Reports

By: Carole Cox

After telling her 2nd-grade class that they would be going on a field trip to the local aquarium, the teacher asked them if they had any questions. One boy shot his hand in the air and asked: Do sharks eat people? The rest of the class was stone silent, waiting tensely for the teacher to reply. She in turn asked two questions. First, “Who would like to find out if sharks eat people?” Every student in the room shot their hand in the air. Second, “How do you think we can find the answer to that question?”

Rationale

Using students’ questions as a basis for investigations in science education has been called the interactive approach or question raising approach. Not only do students pose questions they would like answered, but they are asked to find ways to answer them (Chin & Keyalvizhi, 2002; Gibson, 1998; Werts, Todd, & Alson, 1997). Teachers have effectively relied on language and literacy teaching approaches by encouraging students to ask questions, engaging in class and small group discussions, and finding other ways to explore ideas through speaking and writing when teaching science (Flick, 1996).

Teachers also need to engage children in exploration of ideas through discussion and instructional conversations. Research has also shown that older elementary and middle school students benefited from discussing inquiry-based questions, ideas, and explanations in small groups and shared and justified their socially constructed explanations with other groups (Meyer & Woodruff, 1997; Woodruff & Meyer, 1997).

Inquiry process skills in science can begin with students describing phenomena through a process of questioning, observing, enumerating, classifying, measuring, comparing, and communicating. As they explain phenomena, they again begin with questioning, leading to hypothesizing, inferring, interpreting data, and communicating. When they move to experiments, again the first step is questioning, leading to predicting, identifying and controlling variables and experiments, and communicating findings. Questioning is a key first step in using constructivist principles by eliciting students’ ideas as a basis for further discussion and reflection in science teaching (Akerson, Flick, & Lederman, 2000; Vosniadou, Ioannides, Dimitrakopoulou, & Papademetriou, 2001).

Science standard

2. Science as inquiry


Strategy

Read aloud a fiction or nonfiction science-related book and lead a discussion asking reader response questions to engage students and to encourage them to ask questions for which they would like to find answers: What did you wonder about while I was reading? List, or have students list, the question on chart paper, on a KWL chart, or on an overhead transparency; these questions can guide further inquiry. The following conditions have been shown to encourage students to raise questions:

- Set up discourse structures such as brainstorming and KWL charts that elicit student questions.
- Engage students in conversations about familiar contexts in which they have made many observations over a long period of time.
- Create comfortable discussion periods where students can try to understand each other’s thinking.
- Establish small, collaborative groups.

Students can work in groups to answer different questions using the jigsaw cooperative learning technique. Collect a text set of books on the topic; students can form book clubs to read and research answers to the question they have chosen. They can also do library and online research, investigations, and experiments.

A series of nonfiction children’s books that focuses on a science question to be answered in each book can also be used. One of these books could
Grade-level modifications

K–2nd Grade

Many nonfiction science books use a question and answer format; one of these could be read aloud to model asking and answering questions as a way to learn about a topic in science. For example, the book *Sharks* by Ann McGovern (1976), uses this format. Each double-page spread of this picture book is a chapter that shows a question in boldface type, followed by an answer, beautifully illustrated by simple but elegant graphite pencil sketches. The table of contents lists each question followed by a page number.

Guided by the list of questions, the class can create their own Q&A book. First, write each question at the top of a piece of chart paper and read aloud other books on the topic, lead class discussions, and then record student ideas about answers to each question on the chart. Interactive writing, where young students take the pen to write on the chart paper, can be used as well. When the questions have been answered on each chart, students in groups can choose and illustrate a chart. To communicate what they have learned, the charts can be placed on a bulletin board.

Here are more books on sharks and a series of books that uses the question and answer format on science content for younger students.

Recommended children’s books

<table>
<thead>
<tr>
<th>Sharks</th>
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<tr>
<td><em>Chomp! A Book about Sharks</em>, By Melvin Berger</td>
<td></td>
</tr>
<tr>
<td><em>The Truth about Great White Sharks</em>, By Mary Cerullo</td>
<td></td>
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<tr>
<td><em>Sharks</em>, By Ann McGovern</td>
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<tr>
<td><em>Sharks</em>, By Seymour Simon</td>
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</tbody>
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Q&A series on science: Ask Dr. K. Fisher

- *Ask Dr. K. Fisher about Animals*, By Carolyn Llewellyn
- *Ask Dr. K. Fisher about Dinosaurs*, By Carolyn Llewellyn
- *Ask Dr. K. Fisher about Creepy-Crawlies*, By Carolyn Llewellyn
- *Ask Dr. K. Fisher about Reptiles*, By Carolyn Llewellyn
- *Ask Dr. K. Fisher about Planet Earth*, By Carolyn Llewellyn
- *Ask Dr. K. Fisher about Weather*, By Carolyn Llewellyn

The format of these books is that questions are mailed to a Dr. K. Fisher, an anthropomorphized kingfisher bird, by other anthropomorphized animal characters who ask questions about themselves that Dr. K. Fisher answers. The books are highly illustrated and humorous but contain factual information in all the answers.

3rd Grade–5th Grade

Introduce a topic in science with a book that uses the Q&A format, and generate a list of questions on a KWL chart. Do a book talk of several of these books in a series, and have students form groups, choose a book and a topic, generate a list of questions, and work in their groups to answer a question through further reading, online research, field trips, interviews, and first-hand experiences.

They can compile their collective Q&A results and communicate them in a variety of ways. For example, they could make a class book, modeled after one of the Q&A series books they have read — with a table of contents listing each question and a page number where question, answer, and illustrations can be found. Other ways they can communicate what they have learned include creating a PowerPoint presentation with a question and answer on each slide, a reader's theater presentation with the questions and answers in dialogue, and a curriculum-simulated interview with an expert who answers questions posed by interviewers.

Here are two series of nonfiction science books that use a question and answer format that can be used to find information and also model how to communicate the information the students have learned.

Recommended children’s books

- *How Big Is It?*, By Ben Hillman
- *How Fast Is It?*, By Ben Hillman
- *How Strong Is It?*, By Ben Hillman
- *How Weird Is It?*, By Ben Hillman

Scholastic Question and Answer Series: Life Science

- *Did Dinosaurs Live in Your Backyard?*, By Melvin and Gilda Berger
Scholastic Question and Answer Series: Earth and Space

- **Can It Rain Cats and Dogs?** By Melvin and Gilda Berger
- **Do Stars Have Points?** By Melvin and Gilda Berger
- **Do Tornadoes Really Twist?** By Melvin and Gilda Berger
- **Why Do Volcanoes Blow Their Tops?** By Melvin and Gilda Berger
- **Can You Hear a Shout in Space?** By Melvin and Gilda Berger
- **What Makes an Ocean Wave?** By Melvin and Gilda Berger
- **Does It Always Rain in the Rainforest?** By Melvin and Gilda Berger

**English language learners**

Provide Q&A frames for students to provide visual structure. Each frame can include the question and can change the question to a statement to begin the answer.

**Q&A Frame**

<table>
<thead>
<tr>
<th>Questions</th>
<th>Answers</th>
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<tbody>
<tr>
<td>What do sharks eat? Sharks eat....</td>
<td></td>
</tr>
<tr>
<td>Where do sharks live? Sharks live....</td>
<td></td>
</tr>
<tr>
<td>What do sharks look like? Sharks look like....</td>
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Most Q&A format nonfiction science books use visuals to convey information, such as drawings, diagrams, models, maps, charts, and graphs, providing comprehensible input for English learners to acquire content information. These books also provide a model for English learners to communicate their ideas through visuals as well as writing.

**Struggling students**

Model and use a frame and sentence starters for struggling students to record both their questions and answers:

**Topic**

Our topic is....

**Question**

Our question is...?

**Answer**

Our answer to the question is....

**Assessment**

Students can self-assess to see if they have answered their questions, and they can describe what they learned about the topic and identify what materials, tools, and skills were most useful.
Student self-assessment for Q&A

1. What was your question?
2. Why was that an interesting question to you?
3. How did you find answers to the question?
4. What was most useful to you in answering your question?
5. What else would you like to know about the topic of the question?
6. How could you find out?

For younger students, ask questions of groups or the class as a whole; older students can respond in writing or in a teacher conference, where dictation for English learners or struggling students can occur. This type of assessment provides information for planning further instruction for each student.

References


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Controversies in Neuroscience: A Literature-Based Course for First Year Undergraduates that Improves Scientific Confidence While Teaching Concepts. Article in Journal of Undergraduate Neuroscience Education 12(2):A159-66 Â· April 2014 with 63 Reads. Source: PubMed. Cite this publication.Â Many times during the course of teaching this material, I remind my students that during times of scientific controversy, while disagreements can reveal the passion scientists have for their work, the act of disagreement does not challenge the edifice of established knowledge in science, but instead serves to strengthen it (Osborne, 2010).