Raising Future Scientists:  
Identifying and Developing a Child’s Science Talent,  
A Guide for Parents and Teachers  
Nancy N. Heilbronner, PhD

Abstract: Parents and teachers may suspect early science talent in children, which frequently manifests itself through insatiable curiosity and an intense interest in one or more areas of science. However, sometimes they struggle with identification and then knowing what to do to nurture these talents. The author of this practical article provides a rationale for why early identification is important and then discusses ways to spot and develop children’s talents in the sciences. Strategies and lists of resources that parents and teacher may use to nurture talent are provided.

Keywords: gifted education, parents, teachers, early identification, talent development

Amy was like any other 10-year-old child, except for one major difference: Amy loved all things science. But not all at once—Amy loved them sequentially. Her mom remembered once, about 4 years ago, when Amy discovered frogs. It seemed to happen overnight—Amy was watching some alien-looking frogs swimming in her backyard pond when she decided she had to know everything about these mysterious amphibians. Begging her mom to take her to the community library, Amy checked out dozens of books on frogs . . . and read them all! Next, she begged for a terrarium set up with her very own frogs. Everything had to be about frogs: For the holidays, Amy received a frog comforter, frog socks, and even a little toy frog that hopped about, chasing imaginary flies. She was insatiable for frogs! However, months later, as suddenly and mysteriously as it appeared, Amy’s obsession with frogs disappeared. Her mother discovered this fact when she brought home yet another book from the bookstore on frogs and presented it to Amy, who yawned. “That’s nice,” sighed Amy, “but did you see any books on pandas?”

Amy’s experience is fairly typical of the child who is talented and interested in science. At the time, it may be frustrating for teachers and parents as they experience children’s carousel of interests. Take comfort, though, because this whirlwind of early intensity may be the signal of great things to come. You may be watching the child’s first explorations into the world of science, and for the bright child, that can be an invigorating, heady experience. So much to see! So much to do! What to sample first?

What do we know about science talent? First, we know that it often begins at a young age. A number of researchers (Feist, 2006; Sosniak, 1985; Subotnik & Steiner, 1993) have completed work in this area, and their findings are consistent. Many scientists who achieve prominence in their fields discuss how they knew from a very young age, often as early as 6 or 7, that they were interested in science. They report having spent a good deal of time “mucking about” informally with science things. For example, they may have owned microscope or chemistry sets, spent time putting Erector sets together, or take other things (such as computers) apart to see how they worked. They may have read voraciously, and their interests, while focused on science topics, were often varied. That is, they did not focus on one area of science until much later. Instead, they wanted to explore the whole world through the lens of science. Teachers often see this type of curiosity in the classroom; talented children enter kindergarten eager and excited to know more. They may already possess a wealth of information about many science topics, and they may be eager
to share what they know with their fellow students. They ask many questions and astound (and sometimes intimidate) their teachers with their depth of knowledge. They’re all set to soar, right?

The Current State of Science in the Classroom

Unfortunately, these eager learners may discover that school is not the place to explore science in the way they wish, and there are a number of reasons why. During the past 15 years, public schools have experienced a huge push for accountability in the form of high-stakes standardized testing. The passage of No Child Left Behind, a piece of legislation whose framers no doubt had good intentions, inadvertently has led to the increase of classroom time spent on teaching reading and math and less time that was able to be devoted to science (National Center for Education Statistics, 2007). And instead of being allowed to focus on hands-on, minds-on learning opportunities, teachers may receive overt or subliminal messages that may encourage them to teach to a high-stakes test (Scot, Callahan, & Urquhart, 2009).

It remains to be seen how the Common Core Standards will impact this process in science. However, this type of teaching may lead to a decline in students’ love of science, a fact that appears to be supported by research. Before the end of middle school, engagement with science has seriously declined, and by the time students are ready to declare college majors, only 16% of students declare majors in science, compared with the United Kingdom (25%), France (26%), or Germany (27%; Institute of Educational Sciences, 2009). In American graduate schools, nearly half of students studying the sciences are international, and although these students might once have spent their careers here, many now are opting to return home. Some areas of science are experiencing a serious shortage, such as engineering, a fact that carries with it major implications for the future of our country.

These conditions make it especially important that parents and teachers work to identify and nurture the interests and abilities of students with talents in science by allowing children to informally experience the pure joy of science. In a well-known study, Harvard psychologist Dr. Benjamin Bloom (Sosnaiak, 1985) and a team of researchers interviewed high-achieving individuals, their parents, and their teachers. He and his team interviewed scores of talented individuals from the fields of music and art, athletics, and mathematics and science, investigating factors that these individuals believe had contributed to the development of their talent. Participants generally attained prominence in their fields before the age of 35. They interviewed neuroscientists, many of whom had gone on to win prestigious awards, and they found that many of these individuals reported spending a great amount of time learning informally at home, by themselves or with their parents. Teachers also sometimes played a role in this informal learning. These talented scientists played at science as children—that is, they “mucked about,” and they often mentioned these informal experiences as influential in their decisions to enter careers in science.

Identifying Science Talent

How can you tell whether a child has science talent? How do you know whether he or she has the potential to become successful in the field? Fortunately, there are several indicators of early science talent. Surprisingly, none of them is grades, for many students earn high marks in science, but it is not a consistent indicator of talent. Instead, look for these indicators, taken from the Scales for Rating the Behavioral Characteristics of Superior Students (Renzulli, Siegle, Reis, Gavin, & Sytsma, 2009):

1. **Demonstrates curiosity about scientific processes**—The child enjoys designing investigations, even informal ones, to solve problems. He might, for example, try to figure out which type of fish in the aquarium is most responsive to light or to human presence.
2. **Demonstrates creative thinking about scientific debates or issues**—The child is able to take a complex issue and see more than one side. She may like to argue with you or other children about scientific ideas. She might, for example, argue with you about whether global warming is real.
3. **Demonstrates enthusiasm in discussion of scientific topics**—The child loves to discuss science with other children or adults. He might go on and on about characteristics of certain exotic animals, for example.
4. **Is curious about why things are as they are**—The child may ask many questions about the world around her. For example, while riding in the car, you might be bombarded with questions such as, “Why is the sky blue? Why is the grass green? Could there be people on other planets?”
5. **Reads about science-related topics in his free time**—The child is thirsty for science knowledge. He may love to read books, magazines, and websites that give him this information, and/or he may spend hours watching the Science or Discovery channels.
6. **Expresses interest in science projects or research**—The child may be the one who becomes excited when Science Fair is announced at school, or she may express a wish to do “real” research (e.g., in a science competition).
7. **Clearly articulates data interpretation**—The child is learning how to interpret data—look at results of any science investigation and make sense of them. He may like to turn the numbers into graphs and search for patterns.

If your child or student has a majority of these characteristics, you probably have a child who has the potential to become a scientist!

Nurturing Science Talent

If your child or student possesses talents in science, what can you do to encourage that talent? Fortunately, parents
Table 1. Strategies to Promote Scientific Talent

<table>
<thead>
<tr>
<th>Strategies That Emphasize Things</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Stockpile raw materials.</td>
<td>1 Encourage investigations.</td>
</tr>
<tr>
<td>2 Create a science library.</td>
<td>2 Take your child on Science Safaris.</td>
</tr>
<tr>
<td>3 Acquire audiovisual resources that emphasize science.</td>
<td>3 Talk about shared experiences.</td>
</tr>
</tbody>
</table>

and teachers can do a great deal when it comes to talent development. After all, you are the ones who know the child best—his likes and dislikes, his strengths and weaknesses. What follows is a kind of generic list of things to do that may spur a continuing engagement in science. Some suggestions cost more than others, but for many of the suggestions, all you need is an interest in your child or student and that most precious of all resources—time. For organizational purposes, the list is divided into two categories: suggestions that are mostly about things (e.g., objects and materials) and suggestions that are mostly about time. These strategies are summarized in Table 1.

Things

**Strategy 1: Stockpile "Mucking-About" Materials.**

Remember how many of the scientists in the Bloom study discussed “mucking about?” To do this, you need materials! If you are lucky enough to be able to afford science kits for your child, by all means, buy them. However, many parents and teachers are on a shoestring budget, especially these days. Fortunately, it's not necessary to buy expensive kits for a child to gain the benefits of playing with inexpensive science materials, because many materials may be purchased used at yard sales or thrift stores, and others are at grocery stores. Still others may be purchased inexpensively from science supply stores on the Internet. You might want to start a list of materials tailored to the interests of your child or talented student. For example, if she is interested in electronics, you could purchase her an old used radio for less than a dollar and let her take the thing apart. You could consider collecting any or all of the “mucking-about” materials found in Table 2, classified by science strand.

**Strategy 2: Create a Science Library.**

Set up a shelf in your home or classroom for science books and then create a science library. There are tons of great science and science fiction books for kids, and so rather than try to list them all, you may wish to check out bibliographies listed in Table 3.

Yard sales are again a good source for these books, although if you’re looking for a particular book, many may be ordered used from sources such as Amazon.com for as little as a penny plus shipping costs! And of course, in today's electronic world, many digital versions of these books exist for download onto an electronic device.

**Strategy 3: Acquire Audiovisual Resources That Emphasize Science.**

Parents and teachers today are fortunate that a wealth of audiovisual material is available at very little cost. Songs abound on the Internet, from the “Vibration Science Song” to “Meet the Elements.” Videos are also available, such as the ever-popular Bill Nye and BrainPop. For a more detailed listing of these and other resources, see Table 4.

Also, don’t overlook the potential for science fiction to intrigue these children. Some of the most successful individuals in the world were inspired by science fiction (e.g., George Lucas). Besides the shows that we all think about (e.g., Star Wars), you'll want to expose your child to other excellent age-appropriate science fiction shows (e.g., Twilight Zone and Star Trek) and movies (e.g., Independence Day and Contact). These shows tease the imagination and inspire young people to think about science in a different, more exciting way.

Activities

Besides investing in science things for the talented child, it is important to think about the types of science activities that you as a parent or teacher can do together. By investing time in these activities, you are saying that you value them and the learning that occurs in them. In addition, for parents, these activities may serve as bonding adventures that you can reminisce about with your child forever!

**Strategy 1: Encourage the Child to Investigate.**

One of the most important activities that you can do is to encourage him or her to investigate the world, with or without the stockpile of materials from the previous step. In this, you are aided by your child's own curiosity. Fortunately, resources for scientific investigations abound (see Table 5).

The key here is to encourage the child to set up regular investigations based on his questions. "Why does that bug want to walk over to my soda?" he might ask. "I don't know," you might reply, "but how could we find out?" Thus, you could launch a simple experiment to find out what types of liquids that might attract the "bug." And don't take the fun and joy out of these investigations. Don't insist that he write everything down or name variables, write procedure. He'll get enough of that in school. Just encourage him to do the
### Table 2. “Muck-About” Materials

<table>
<thead>
<tr>
<th>Science Strand</th>
<th>Materials</th>
</tr>
</thead>
</table>
| Chemistry      | Beakers or other containers  
                 Common chemical compounds and mixtures—baking soda, vinegar, salt, sugar, sand  
                 Food dye  
                 Food substances (e.g., marshmallows)  
                 Hot plate  
                 Measuring cups  
                 Medicine droppers  
                 Tongs |
| Earth science  | Different types of rocks and minerals (e.g., metamorphic, sedimentary, igneous)  
                 Rock collecting tools  
                 Weather tools: thermometer, hydrometer, barometer, rainfall gauge, wind vane, anemometer, etc.  
                 Crystal grow kits |
| Life science   | Aquarium  
                 Collecting materials  
                 Fertilizer  
                 Fish  
                 Frogs  
                 Herbs—dried and fresh  
                 Lizards  
                 Microscope  
                 Plants—flowering and vegetable  
                 Potting soil  
                 Salamanders  
                 Seeds  
                 Turtles  
                 Yeast  
                 Worms |
| Physical science | Balloons  
                  Bouncing balls of different sizes and types  
                  Metronome  
                  Mirrors  
                  Old electronic equipment (e.g., radio, phone, television, fans, computers, etc.)  
                  Pliers  
                  Pulleys  
                  Rope  
                  Rubber bands  
                  Scissors  
                  Tuning fork  
                  Wire |

(continued)

### Table 2. (continued)

<table>
<thead>
<tr>
<th>Science Strand</th>
<th>Materials</th>
</tr>
</thead>
</table>
| General        | Antibacterial cleanser  
                 Baby food jars (emptied)  
                 Balances  
                 Batteries  
                 Building sets (e.g., Kinex and Legos)  
                 Buttons  
                 Clay or playdough  
                 Construction paper  
                 Cooking oil  
                 Flashlights  
                 Foam peanuts  
                 Gloves—latex free  
                 Glue  
                 Hammer and nails  
                 Paper cups  
                 Pipe cleaners  
                 Plastic spoons  
                 Rulers  
                 Sandpaper  
                 Saw  
                 Screwdriver  
                 Shoe boxes  
                 Soda straws  
                 Sponges  
                 Steel wool  
                 String  
                 Tape  
                 Toothpicks  
                 Wax  
                 Wax paper  
                 Wood pieces |

investigation, provide some guidance, and then talk about what happens!

### Strategy 2: Take Your Child on Trips—Science Safaris.

A big world is out there, waiting to be explored, and you don’t have to have a lot of money to take children on these trips. I like to call these trips Science Safaris, because the phrase conjures up images of explorers going out to make discoveries, which is exactly what you’ll be doing. Science Safaris can be short or long—as little as an hour and as long as weeks, depending on what you’d like to accomplish and the resources you have. Parents, if you live in a rural area, you could start by taking your child out for hikes or camping in the woods. Bring along nature guides and try to identify the flora and fauna along the path. Camp out for on a clear night in a field with a pair of binoculars; try to see how many constellations you can spot. If you’re closer to a city, check out free or inexpensive science museums that abound. Go on city walks and try to identify different building materials...
Table 3. Websites With Bibliography of Children’s Science Books

<table>
<thead>
<tr>
<th>Title of Website</th>
<th>Address</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>The 80 Greatest Science Fiction Books for Kids</td>
<td><a href="http://www.onlinecollegesanduniversities.net/blog/2011/the-80-greatest-science-fiction-books-for-kids/">http://www.onlinecollegesanduniversities.net/blog/2011/the-80-greatest-science-fiction-books-for-kids/</a></td>
<td>Specializes in science fiction; contains links to Amazon to order the books.</td>
</tr>
<tr>
<td>Good Science Books for Children</td>
<td><a href="http://www.science.org.au/pi/goodbooks/index.html">http://www.science.org.au/pi/goodbooks/index.html</a></td>
<td>Published by the Australian Academy of Science, the site contains descriptions of each book.</td>
</tr>
<tr>
<td>Kids’ Nonfiction</td>
<td><a href="http://www.mariannedyson.com/spacebooks.htm">http://www.mariannedyson.com/spacebooks.htm</a></td>
<td>Books on space are reviewed by author and NASA flight controller Marianne Dyson</td>
</tr>
<tr>
<td>Popular Science Books for Children</td>
<td><a href="http://www.popularscience.co.uk/books%20children.htm">http://www.popularscience.co.uk/books%20children.htm</a></td>
<td>Summaries and reviews are provided.</td>
</tr>
<tr>
<td>Surprising Science: Great Science Books for the Little Ones</td>
<td><a href="http://blogs.smithsonianmag.com/science/2010/12/great-science-books-for-the-little-ones/">http://blogs.smithsonianmag.com/science/2010/12/great-science-books-for-the-little-ones/</a></td>
<td>Published by the Smithsonian, this list contains reviews of high-quality books.</td>
</tr>
</tbody>
</table>

Note: NASA = National Aeronautics and Space Administration.

Table 4. Audiovisual Resources for Children

<table>
<thead>
<tr>
<th>Media</th>
<th>Title of Channel of Program</th>
<th>Website or Fan Site</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Songs</td>
<td>Music Room</td>
<td><a href="http://suzyred.com/music.html">http://suzyred.com/music.html</a></td>
<td>A wide variety of songs in many areas</td>
</tr>
<tr>
<td></td>
<td>Science Songs and Videos</td>
<td><a href="http://www.learninggamesforkids.com/science_songs.html">http://www.learninggamesforkids.com/science_songs.html</a></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Songs for Teaching</td>
<td><a href="http://www.songsforteaching.com/index.html">http://www.songsforteaching.com/index.html</a></td>
<td>Contains many different science songs and their lyrics, as well as other products</td>
</tr>
<tr>
<td></td>
<td>The Totally Free Children’s Learning Network</td>
<td><a href="http://www.kidsknowit.com/educational-songs/index.php">http://www.kidsknowit.com/educational-songs/index.php</a></td>
<td>Contains many science songs categorized by topic area</td>
</tr>
<tr>
<td>Television</td>
<td>Animal Planet</td>
<td><a href="http://animal.discovery.com/">http://animal.discovery.com/</a></td>
<td>Offers many shows on animals of all kinds. The website also offers video clips and games.</td>
</tr>
<tr>
<td></td>
<td>Discovery Channel</td>
<td><a href="http://dsc.discovery.com/">http://dsc.discovery.com/</a></td>
<td>Offers a number of high-quality science shows, including Dinosaur Revolution, Mythbusters, Shark Week, and more.</td>
</tr>
<tr>
<td></td>
<td>Dragonfly TV</td>
<td><a href="http://pbskids.org/dragonflytv/">http://pbskids.org/dragonflytv/</a></td>
<td></td>
</tr>
</tbody>
</table>

(continued)
Table 4. (continued)

<table>
<thead>
<tr>
<th>Media</th>
<th>Title of Channel of Program</th>
<th>Website or Fan Site</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Science fiction—television and movies</td>
<td>Contact</td>
<td></td>
<td>Starring Jody Foster, this film imagines what it might be like if Earth were contacted by extra-terrestrial beings.</td>
</tr>
<tr>
<td></td>
<td>Quantum Leap</td>
<td><a href="http://www.projectquantumleap.com/">http://www.projectquantumleap.com/</a></td>
<td>Documents the travels of a scientist as he leaps through time in an effort to right wrongs.</td>
</tr>
<tr>
<td></td>
<td>The Twilight Zone</td>
<td><a href="http://www.twilightzone.org/">http://www.twilightzone.org/</a></td>
<td>Decades ago, Rod Serling hosted this popular show using a science fiction format. You may wish to screen content for level of intensity.</td>
</tr>
<tr>
<td>Video</td>
<td>Bill Nye the Science Guy</td>
<td><a href="http://www.billnye.com/">http://www.billnye.com/</a></td>
<td>Highly engaging science video clips (under &quot;Media&quot;). Full videos may be purchased.</td>
</tr>
<tr>
<td></td>
<td>Brainpop</td>
<td><a href="http://www.brainpop.com">http://www.brainpop.com</a></td>
<td>Engaging animated science videos. Also contains quizzes, experiments, and more.</td>
</tr>
<tr>
<td></td>
<td>National Geographic</td>
<td><a href="http://kids.nationalgeographic.com/">http://kids.nationalgeographic.com/</a></td>
<td>Long known for high-quality work in the natural world, these videos and games are geared toward children.</td>
</tr>
</tbody>
</table>

and architectural periods for the city’s skyscrapers. Go on a city walk to spot the different types of machines at work. Challenge children to reconstruct models of them at home or in the classroom using simple materials. As always, let the child’s interests be your guide. Perhaps she lights up when you suggest going to the Butterfly Habitat, or maybe it’s the Lego Museum. Opportunities abound, and you’re the guide.

**Strategy 3: Talk About Shared Experiences.**

Interestingly, one of the most important things you can do to as a parent or a teacher is to talk to children! Discussion is a powerful motivator for all kinds of positive outcomes—achievement, well-being, and more. In terms of developing science talent, this activity is especially important for young children, who naturally want to share their discoveries with you. However, it is especially important for parents, because it lays the foundation for a lifetime of continued communication. The trick here is to be nonjudgmental, yet involved. For example, if your child doesn’t express an interest in medicine and you want him to be a doctor, don’t push it. He will figure out soon enough that you have an agenda and turn away from it. A better strategy is to expose your child to a variety of experiences and let him determine where his interests lie. This is sometimes hard for a parent to do, but it pays off in the long run. Consider using the following open-ended questions to explore your child’s perceptions about the experiences you’re sharing:

- What did you think about what we did today?
- Did anything intrigue you?
- Is there anything you’d like to learn more about?
- Is there something else we could do that would be fun?

Also, don’t be afraid to have an honest dialogue about your thoughts, but consider that the dialogue has to be done in a special way—a way that communicates that you respect your child’s opinion. Consider the following exchange:

Mother: What did you think about the zoo trip that we took today?
Son: It was okay, but it was hot.
Table 5. Websites With Science Investigations for Children

<table>
<thead>
<tr>
<th>Site</th>
<th>Web Address</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cool Science for Kids, by the Howard Hughes Medical Center</td>
<td><a href="http://www.hhmi.org/coolscience/forkids/">http://www.hhmi.org/coolscience/forkids/</a></td>
<td>Interactive multimedia site with engaging activities for children.</td>
</tr>
<tr>
<td>Glowing Water</td>
<td><a href="http://www.youtube.com/watch?v=6hX8H66I62">http://www.youtube.com/watch?v=6hX8H66I62</a></td>
<td>YouTube is filled with fun investigations such as this one and Flubber (see below)!</td>
</tr>
<tr>
<td>Kids Science Experiments</td>
<td><a href="http://www.kids-science-experiments.com/">http://www.kids-science-experiments.com/</a></td>
<td>Many different science investigations, categorized by topic.</td>
</tr>
<tr>
<td>Let's Investigate, by Ellen Booth Church (Published by Scholastic.com)</td>
<td><a href="http://www.scholastic.com/resources/article/lets-investigate">http://www.scholastic.com/resources/article/lets-investigate</a></td>
<td>Online article about what's important to young children.</td>
</tr>
<tr>
<td>National Science Teachers' Association (NSTA)</td>
<td><a href="http://www.nsta.org/">http://www.nsta.org/</a></td>
<td>A wealth of resources for teachers and parents</td>
</tr>
<tr>
<td>Science Kids, Science Experiments for Kids</td>
<td><a href="http://www.sciencekids.co.nz/experiments.html">http://www.sciencekids.co.nz/experiments.html</a></td>
<td>Experiments, games, projects, lessons, quizzes, and more!</td>
</tr>
<tr>
<td>Science Projects: Making Flubber</td>
<td><a href="http://www.youtube.com/watch?v=NhmRKpCCQmE">http://www.youtube.com/watch?v=NhmRKpCCQmE</a></td>
<td>To locate more video demonstrations on investigations, try typing in a search term (e.g., “balloons”).</td>
</tr>
<tr>
<td>Steve Spangler Science</td>
<td><a href="http://www.stevespanglerscience.com/">http://www.stevespanglerscience.com/</a></td>
<td>A wealth of science kits, projects, and toys</td>
</tr>
</tbody>
</table>

Mother: Yes, it was hot. What did you think about all the animals we saw?
Son: They were okay, but I wish we could have seen more butterflies. I really like butterflies.
Mother: I really liked the tigers we saw. I like seeing really large mammals. But you have different interests, I can see, and that’s okay. How about if we plan a trip to a butterfly habitat?
Son: Could we??

In this conversation, the mother validated the son’s interests while maintaining honesty about her own interests. In the future, with more of this type of validation, her son should develop the idea that her mother is interested in helping him discover and develop his own interests and talents.

Strategy 4: Investigate Informal Learning Opportunities, Near and Far.
A wide variety of informal learning opportunities exists for talented students. Parents and teachers can become aware of these opportunities, which may be located in nearby communities or farther away. Community resources will vary from location to location, but look for programs offered by local universities that may allow students to work with scientists (usually over the summer) in a laboratory setting. Other communities may operate programs through local museums or youth organizations. Regional or national opportunities for talented students are available through a variety of talent searches and competitions, some of which are listed in Table 6. Talent searches generally accept students who qualify in a certain way (e.g., scoring at or above a 600 on an SAT component in seventh grade). Check each program’s website for specific information.

Conclusion
Parents and teachers of children with talents in science have many options to help them identify and nurture their interests and abilities. Like Amy, these children offer our best hope for the future—in medicine, in technology, in engineering, and
### Table 6. Resources to Promote Informal Science Learning

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Books</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Surrounded by Science: Learning Science in Informal Environments,</em> by Marilyn Fenichel and Heidi A. Schweingruber, and published by the National Academies Press</td>
<td>Available to order or skim online for free at <a href="http://www.nap.edu/catalog.php?record_id=12614">http://www.nap.edu/catalog.php?record_id=12614</a></td>
<td>Informative online book that discusses learning in informal environments</td>
</tr>
<tr>
<td><strong>Competitions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christopher Columbus Awards</td>
<td><a href="http://www.christophercolumbusawards.com/">http://www.christophercolumbusawards.com/</a></td>
<td>Students use the scientific method to identify a community need and write a grant to address it.</td>
</tr>
<tr>
<td>Craftsman/NSTA Young Inventors</td>
<td><a href="http://www.nsta.org/programs/craftsman/">http://www.nsta.org/programs/craftsman/</a></td>
<td>Focuses on inventions using STEM skills</td>
</tr>
<tr>
<td>ExploraVision Awards</td>
<td><a href="http://www.exploravision.org">http://www.exploravision.org</a></td>
<td>Sponsored by NASA and NSTA and open to students in K-12</td>
</tr>
<tr>
<td>Future Problem Solvers</td>
<td><a href="http://www.fpspi.org/">http://www.fpspi.org/</a></td>
<td>Stimulates critical and creative thinking skills, and open to students in Grades 4 to 12.</td>
</tr>
<tr>
<td>Intel ISEF</td>
<td><a href="http://www.intel.com/about/corporateresponsibility/education/isef/index.htm">http://www.intel.com/about/corporateresponsibility/education/isef/index.htm</a></td>
<td>Science fair board and judging</td>
</tr>
<tr>
<td>Odyssey of the Mind</td>
<td><a href="http://www.odysseyofthemind.com/learn_more.php">http://www.odysseyofthemind.com/learn_more.php</a></td>
<td>Focuses on creative problem solving and is open to students in kindergarten through college</td>
</tr>
<tr>
<td><strong>Talent identification programs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duke Talent Identification Program</td>
<td><a href="http://www.tip.duke.edu">http://www.tip.duke.edu</a></td>
<td>For students in the southeastern region of the nation</td>
</tr>
<tr>
<td>Johns Hopkins Center for Talented Youth</td>
<td><a href="http://cty.jhu.edu">http://cty.jhu.edu</a></td>
<td>For students in the northeastern region of the nation</td>
</tr>
<tr>
<td>Northwestern University's Talent Search</td>
<td><a href="http://www.ctd.northwestern.edu/numats/">http://www.ctd.northwestern.edu/numats/</a></td>
<td>For students in the northwestern region of the nation</td>
</tr>
</tbody>
</table>

Note. NSTA = National Science Teachers’ Association; STEM = Science, Technology, Engineering, and Mathematics; NASA = National Aeronautics and Space Administration; Intel ISEF = Intel International Science and Engineering Fair.
so many other areas. Yet, schools often leave undereducated, unmotivated, and unprepared to take their places in these challenging and exciting careers. Motivated parents and teachers can help to fill in the gaps by providing resources and opportunities for their children to thrive. Be the guide for your young scientist and explore the world through this wonderful lens of science. Who knows, maybe you’re raising the next Albert Einstein of Madame Curie!

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**References**


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