



Adopt-a-Physicist

<http://www.adoptaphysicist.org/>



Adopt-a-Physicist

Students learn that physicists had a hard time getting through high school physics just like they are.
teacher participant

Physicist User's Guide



Welcome!

Adopt-a-Physicist is your chance to connect with the curiosity of kids, most of whom are studying physics for the first time. What does a physicist do? Do you

have a life? What is the ultimate fate of the universe? Does physics have anything to do with *me*? The conversations you have with kids can have a profound impact -- on them, and on you. But rich discussions don't always happen automatically. This User's Guide will offer some best practices that can help you -- and your adopters -- get the most out of the program.

This was a great opportunity to "humanize" science to these kids, and in return I enjoyed figuring out creative ways to engage them
physicist participant

I thought physicists were people who only focused on labs, but now I realized physicists have lives.
student participant

Logistics

The forums are open for 3 weeks, with an additional couple of days after they close for physicists to post any last comments. Typically, each physicist is "adopted" by three classes, who will participate in your online forum. Teachers choose physicists for their classes by searching through the physicist profiles. Classes are most often high school physics or AP physics, with the occasional middle school physical science class. You will receive an email informing you when you have been adopted -- log in to view your classes.

First Steps

The biggest challenge faced on the forums is that students ask similar, simple questions such as "Why did you decide to become a physicist" or "Tell me about an average day." These are fine to start, but many physicists want to get to the deeper questions. These questions can be preemptively answered in the **physicist profile**. Thus, when writing your profile, give a synopsis of who you are (including your career path and a recent photo), but consider adding a "Frequently Asked Questions" portion to your Biography with your answers to common questions (see "**common questions**," below). These mini-essays can also help spark rich initial conversation between you and your students. Check out at other physicists' profiles to get more ideas (click on "Browse Physicists" on your homepage). Note, it's still important to give a personal answer to these questions, so as to not shut down students' curiosity: "That's a great question, Cathy. I talk about this a little in my profile. Let me know if there is anything else you'd like to know."

I ended up answering similar questions from multiple students
physicist participant

How Do the Teachers Use the Program?

Teachers are encouraged to think about Adopt-a-Physicist as a chance to converse with you and the other adopting classes, not as a Q&A session. Classes are expected to participate in their discussion forums regularly for the entire three week period.

Contact with the teacher

Your teacher should email you before the forum to let you know what to expect from his or her students. You will receive the email addresses of teachers whose classes have adopted you. If you haven't heard from your teacher by a few days before the forum, **drop them a note**. This is also a good time to let the teachers know if you have particular time constraints limiting your participation so they can plan accordingly.

Class activities

Teachers have been given a list of suggested questions and activities for use in their classes (see the end of this User's Guide). Some common ways that the forums are used are:

- Most common: Students give individual or group presentations about "their" physicist.
- Discussion or report about what they learned in the forums
- Unstructured participation in forums during class

Feel free to talk to students about their projects and point them to pictures, websites, and other resources that might be helpful in understanding your job or background. If you have an idea for a class activity related to your job or research, share it with the teacher.

Icebreakers

Students may not know just what to ask, and revert to the simple interview-type questions. They may be intimidated by corresponding with a physicist. A **Welcome Message** is automatically posted in your forum when it opens. You can use that welcome message to hook students' interest and set a warm tone for the forums. Here are some ideas:

- Send them some cool physics thing, like a photo or website or

YouTube video (via the   or    buttons in the WYSIWYG editor).

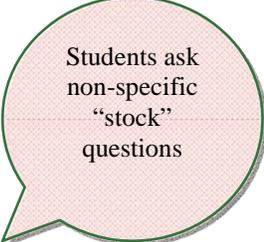
- Give them a hook or a problem or a puzzle. ("Have you ever tried putting ivory soap in the microwave?")
- Ask them some questions about their class, their assignment, their school, or their interests. Get them talking. This is your chance to learn about them.
- Start with a topic of particular interest to you -- such as the status of women in physics, or the ultimate fate of the universe, or just something interesting you read or saw that day.
- Point them to your biography and highlight some key points of your profile.
- Make yourself friendly and approachable (eg., sign off as "Dr. Joe.")
- Make a short video to introduce yourself, and include a link to it.

It would be great if it were more of a forum than a Q&A session.
physicist participant

These videos and pictures are great! I think it is very interesting about all your research on the invisible cloak.
student participant

The Forums

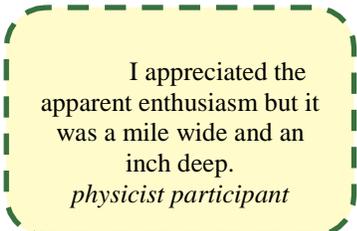
The forums are open for 3 weeks. This is a fraction of the time that you would have to establish rapport with students if you had them in a class. Here are some common challenges faced by participants, and some strategies to help the discussions go smoothly in this short window of time.



Students ask non-specific “stock” questions

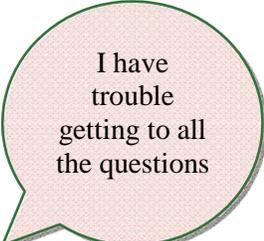
You have a lot to share, but students might not yet know the right questions to ask. **Asking students questions** about themselves or **opening topics of discussion** can help spur meaningful discussion. Why did they choose you as a physicist? What are they learning in class? What do they like to do? Relate some of your own experiences in high school and see if they resonate. Knowing where they are coming from will help

you target your answers more accurately. Posting items of interest to you, as suggested in the Welcome Message can also help spur discussion. Students *begin* to participate in the forums because of a class assignment -- the key is to find their areas of interest, to generate rich discussions.



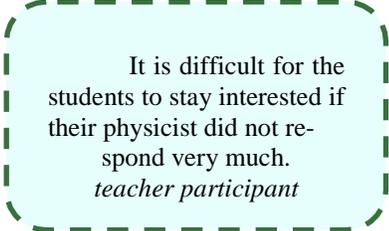
I appreciated the apparent enthusiasm but it was a mile wide and an inch deep.
physicist participant

It's best to respond within a day or two, to keep conversation going and maintain student engagement.



I have trouble getting to all the questions

If you don't have time to respond right away, keep the conversation flowing by dropping a quick note. “Great question! I'm busy preparing a grant report / lab samples / class, and will get back to you tomorrow.” Try **sorting by date** on the forum page to find questions you haven't responded to yet.

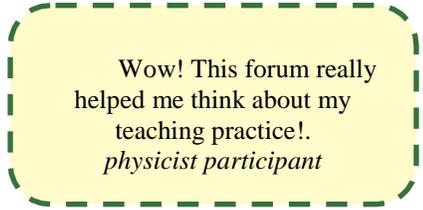


It is difficult for the students to stay interested if their physicist did not respond very much.
teacher participant

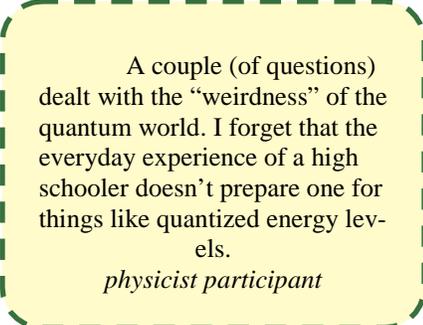
Students in high school are just starting to get a sense of what they might want as a career, and often have little sense of science as a creative enterprise or the nuances of a career in science. They may not have a sense of how physics affects their everyday lives. Part of the goal of this program is to humanize science, and show the appeal of physics as a career. Sharing your experiences and your knowledge, in a way that kids can connect to, can be very satisfying for all.

It's exciting to get questions from students about your work and your life. Here are a few pointers to help ensure that they understand and relate to what you are saying.¹

1. Remember your audience. What do they know about the topic and what questions might they ask? How might your discoveries have impacted the lives of these children?



Wow! This forum really helped me think about my teaching practice!.
physicist participant



A couple (of questions) dealt with the “weirdness” of the quantum world. I forget that the everyday experience of a high schooler doesn't prepare one for things like quantized energy levels.
physicist participant

¹ For more about effective science communication, see https://www.brown.edu/academics/science-center/sites/brown.edu.academics.science-center/files/uploads/Quick_Guide_to_Science_Communication_0.pdf and <http://www.ucusa.org/publications/scientist-media-guide.html>

2. Start with the “so what.” Put your research or experiences into perspective. Show how they are relevant to them, and give examples. If you work on nano silicon light emitters, you could first talk about how LED’s are used in our lives. Be specific.

3. Speak from the heart. Let your passion and personality come through.

4. Tell a story. Tell human stories about your work. When explaining scientific content, use analogies, paint a picture, put numbers into context, use common language and avoid jargon. Relate difficulties and how they were overcome. What sorts of things might you talk about with a colleague over coffee, and how might you translate it in language relevant to children?

I was impressed with the level of curiosity expressed by some of the students. It was fun for me to... think about these things and I recalled that when I was a teenager, I had similar questions and thoughts.

physicist participant

I had a student ask what I was going to “do” with my research. It was really nice to share with her that sometimes science is important just because it furthers our understanding of the universe around us.

physicist participant

You may post a detailed answer to a student question, only to have a different student (from the same class, or another class) ask a related question. If the question is a common one, this may be addressed in a **Frequently Asked Questions** portion of your profile, or your welcome message. However, students may not read the profile in as

Students ask the same questions

much depth as you would like. Rather than risk shutting down their question, indicate that you touch on the topic in your profile, and then expand on that idea. You can keep a running file on your computer with common questions and your answers that you can paste into the forums. There is no way to refer a student to a particular post, but making meaningful post titles can help you point to particular forum posts (Try to avoid the 20-post long “Re:Re:Re: Welcome.” threads by starting new threads if the students don’t). You can also encourage students to read the posts in other parts of the forum.

Many students asked similar questions because they didn’t bother to read earlier answers.

physicist participant

Students don’t respond to my posts

Common student questions

How did you get interested in physics?

Do you have any regrets about being a physicist?

What is a typical day like?

What do you like most/least about being a physicist?

What are you working on / what is your research?

What is the hardest/easiest part of your job?

See “Suggested Discussion Topics” at the end of this manual for the list of questions provided to teachers.

The forum more of a Q&A than a discussion

The art of writing on a discussion board is to keep the conversation going, as in a game of **non-competitive racquetball**. If you are a college faculty, you may have encountered similar problems in class discussion forums -- one or two posts aren't a discussion. In a 3-week interaction, you won't have the ability to create a culture of collaboration, as you could in a college classroom. But we can use what we've learned from discussion boards:

- Engage students based on what they know and their interests
- Approach the conversation as a dialogue, rather than a one-way flow of information
- Ask follow-up questions
- Include images, links, and videos. (Use the WYSIWIG editor to embed files, images, youtube videos, other media)
- Expect students to be active
- Correspond with the teacher if you aren't seeing the type of engagement that you want.

I loved student questions, but most were one question from a student and one reply from me, with little follow-up and not much of a feeling whether I was hitting the mark with my replies.
physicist participant

(The students) have learned so much about a scientist's work routine... from a person working in the field itself that a career in physics doesn't seem to be a job in isolation from fun.
teacher participant

THANK YOU
SIR!!! ^_^ you are so cool!!!
student participant

My students were amazed at what these physicists have done in their careers, but I think they were even more interested in the fact that they are normal (my word, not theirs) human beings
teacher participant

After the three-week session is over, students will no longer be able to post on the discussion forum.

Three weeks is too short!

You will have a few extra days to post any concluding messages. If you would like to stay in touch with your classes, you may provide your contact information to the teachers or post it on the forum. Consider working with the teacher to schedule a follow-up Skype or virtual presentation for additional conversation. **The Adopt-a-Physicist program and its organizers take no responsibility for contact beyond the three week discussion period.**

Appropriate Posting

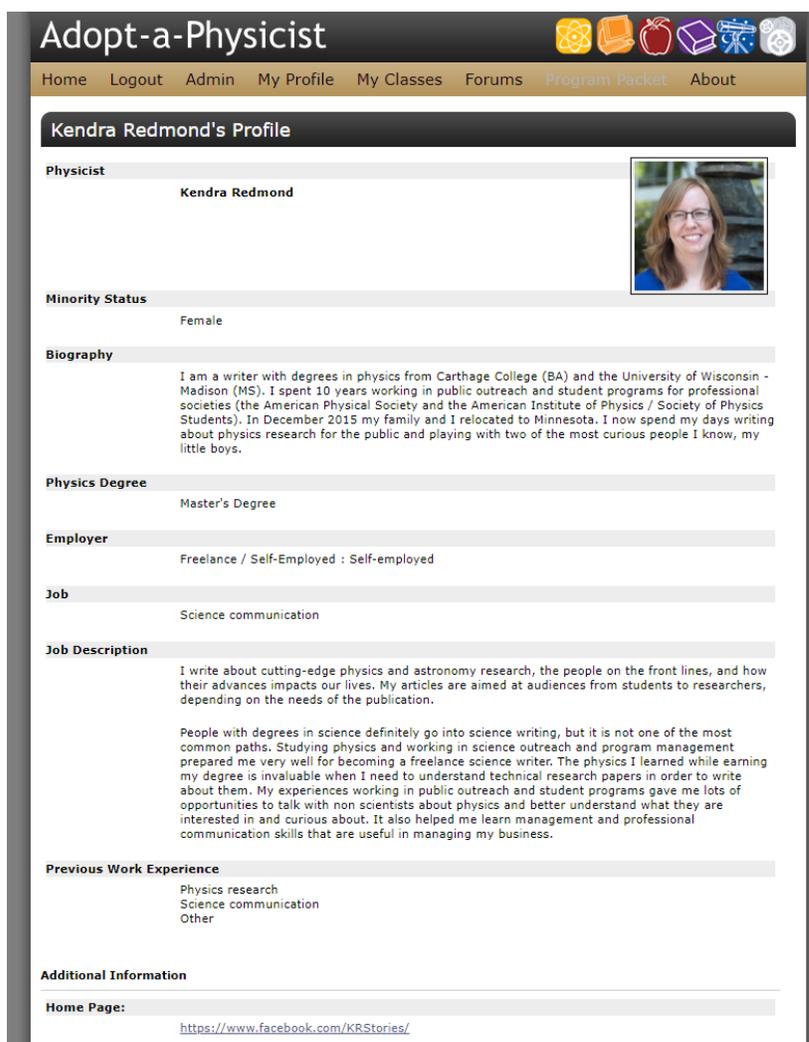
The Adopt-a-Physicist editors will be monitoring the forums and have the right to delete posts and block participants from posting. If comments are posted on your forum that you think should be deleted from the forum, please email the editor, editor@adoptaphysicist.org

If controversial topics (religion, politics, etc.) are brought up on your forum, you might encourage students to investigate different sides of the issue by reading other discussions and talking to others.

Posts of the discussion boards express the views of the author of the message, not necessarily the views of Adopt-a-Physicist or its editorial staff, or any entity associated with it.

How To Use the Forums

Profile



The screenshot shows the 'Kendra Redmond's Profile' page on the Adopt-a-Physicist website. The page has a dark header with the site name and navigation links: Home, Logout, Admin, My Profile, My Classes, Forums, Program Packet, and About. The profile information is organized into several sections:

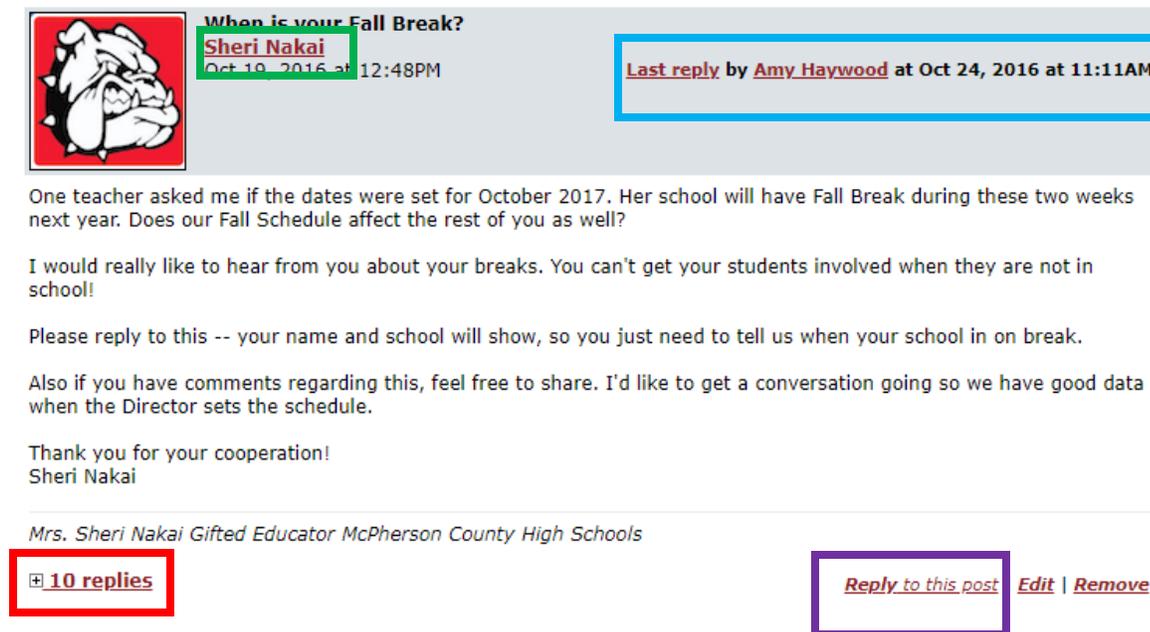
- Physicist:** Kendra Redmond (with a profile picture of a woman with glasses and a blue top).
- Minority Status:** Female
- Biography:** I am a writer with degrees in physics from Carthage College (BA) and the University of Wisconsin - Madison (MS). I spent 10 years working in public outreach and student programs for professional societies (the American Physical Society and the American Institute of Physics / Society of Physics Students). In December 2015 my family and I relocated to Minnesota. I now spend my days writing about physics research for the public and playing with two of the most curious people I know, my little boys.
- Physics Degree:** Master's Degree
- Employer:** Freelance / Self-Employed : Self-employed
- Job:** Science communication
- Job Description:** I write about cutting-edge physics and astronomy research, the people on the front lines, and how their advances impacts our lives. My articles are aimed at audiences from students to researchers, depending on the needs of the publication.

People with degrees in science definitely go into science writing, but it is not one of the most common paths. Studying physics and working in science outreach and program management prepared me very well for becoming a freelance science writer. The physics I learned while earning my degree is invaluable when I need to understand technical research papers in order to write about them. My experiences working in public outreach and student programs gave me lots of opportunities to talk with non scientists about physics and better understand what they are interested in and curious about. It also helped me learn management and professional communication skills that are useful in managing my business.
- Previous Work Experience:** Physics research, Science communication, Other
- Additional Information:** Home Page: <https://www.facebook.com/KRStories/>

When you log in, select “My Profile” to create and edit your profile. You can modify your profile at any time.

Using the discussion boards

You, or the students, can post messages in the “Welcome Message” thread, or start new threads. A thread



When is your Fall Break?
Sheri Nakai
Oct 19, 2016 at 12:48PM
Last reply by Amy Haywood at Oct 24, 2016 at 11:11AM

One teacher asked me if the dates were set for October 2017. Her school will have Fall Break during these two weeks next year. Does our Fall Schedule affect the rest of you as well?

I would really like to hear from you about your breaks. You can't get your students involved when they are not in school!

Please reply to this -- your name and school will show, so you just need to tell us when your school in on break.

Also if you have comments regarding this, feel free to share. I'd like to get a conversation going so we have good data when the Director sets the schedule.

Thank you for your cooperation!
Sheri Nakai

Mrs. Sheri Nakai Gifted Educator McPherson County High Schools

10 replies
Reply to this post | Edit | Remove

is a collection of posts on the same topic. For each thread you will see a subject line, the name of the person or class that created the original post, the original post, and a link to replies to this post. You can read other physicists' forums and profiles (but not post on them).

- **View entire thread** by clicking on the + by the tree of replies
- **View profile** of the author by clicking on the name within a post
- **Reply** by clicking on the “Reply to this post” link OR create a new thread
- **See last reply** in the top right corner. This can be an easy way to identify questions that need response.
- **Create a new thread** (if starting a new topic) using the “Create a new thread” link at the top of your forum page
- In your forum page you may **sort by date** (to see most recent posts at the top) or **by thread** (to see posts by topic). Sorting by date may help you find unanswered posts.
- When composing a message, you may
 - **Link websites or files from your computer** using the  button. To attach a file, click the folder icon to the right of the URL field. URL's may be pasted or typed directly.
 - **Embed images, YouTube videos or other media** by using the buttons on the right side of the toolbar.
 - **Link to previous posts you have authored** using the  button. Click on Link List and navigate to the post you wish to refer to.

Certificate of Participation

You will receive a certificate of participation at the end of this session. We hope that you will hang it in your office with pride, and consider participating again next fall!

Participating Organizations

Sigma Pi Sigma, The Physics Honor Society www.sigmapisigma.org

ComPADRE www.compadre.org

American Association of Physics Teachers www.aapt.org

American Physical Society www.aps.org

ABOUT SIGMA PI SIGMA ($\Sigma\Pi\Sigma$), The Physics Honor Society

Sigma Pi Sigma exists to honor outstanding scholarship in physics; to encourage interest in physics among students at all levels; to promote an attitude of service of its members towards their fellow students, colleagues, and the public; to provide a fellowship of persons who have excelled in physics. Sigma Pi Sigma's mission is not completed in the induction ceremony with the recognition of academic accomplishment. In the four dimensions of Honor, Encouragement, Service, and Fellowship, the mission of Sigma Pi Sigma takes a longer view.

Founded in 1921, Sigma Pi Sigma is a member honor society of the Association of College Honor Societies. Our society has some 75,000 historical members. Election to Sigma Pi Sigma is a lifetime membership.

The Society of Physics Students (SPS) was formed in 1968 with the union of Sigma Pi Sigma and the American Institute of Physics Student Sections. Today Sigma Pi Sigma is housed within the SPS, and both of the societies are member organizations of the American Institute of Physics.

Sigma Pi Sigma www.sigmapisigma.org

Society of Physics Students www.spsnational.org

American Institute of Physics www.aip.org

Suggested Discussion Topics (provided to teachers)

Education

- . Do you think that your education prepared you for your current job? If you could go back, what would you change?
- . What classes should aspiring scientists / physicists take?
- . Do you / how do you use what you learned in physics in your everyday life?
- . What advice do you have for current high school students interested in a career in science?
- . How is your approach to science different from when you were in high school?

Career / Field of Study

- . When you were 18, what did you want to do when you grew up? How has that changed?
- . What skills or personality traits are important for someone working in your field?
- . What do you think is the most significant or pressing problem in your field?
- . What advice would you give to someone looking to enter your field?
- . How easy is it to find a job in your field?
- . Where do you find inspiration? How do you think of original ideas?

Current Job

- . What is your favorite aspect of your job? Least favorite?
- . What is the most interesting or unusual project you have worked on?
- . What are the logistics of your work? (pay, hours, vacation time, travel, time spend working with others versus working alone, balancing work and family, etc.)
- . Where can I find out more about what you do?

For Women and Minorities

- . What is it like to be a woman or minority in your field?
- . Have you encountered any obstacles as a result of your gender / ethnicity? If so, how did you overcome them?
- . What resources are available for women / minorities in your career?
- . Have attitudes toward women / minorities changed during your career?

For Students

- . How did you choose your school?
- . Did you find any resources to help pay for your education?
- . Why did you decide to go to graduate school?
- . How hard is it to study physics in college / grad school?
- . How is studying physics at your level different from studying physics in high school?

For Retired Scientists

- . Did you work in the same field for your entire career, or did you change fields?
- . What are you doing now that you have retired?
- . What changes in society or science have been most meaningful to you as a scientist?

Miscellaneous Topics

- . Science policy
- . Movies / books / leisure activities
- . Life in different geographical locations
- . College / graduate school
- . Science and religion