Exploring and Applying Physics

Facebook group

Member's posts from 2025

Franco Rizzoli
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2024 is the 150th anniversary of the birth of Guglielmo Marconi.
I am posting some photos I took on Saturday, December 28, 2024 in the Mausoleum where he is buried, near the villa from which he made his first experiments in radiotelegraphy.
The initial experiment was to transmit an electromagnetic wave about 2 km away, using a transmitting antenna as in the photo and a coherer receiver made by T. C. Onesti consisting of a glass tube containing iron filings and other metals that, when hit by an electromagnetic wave, becomes a conductor. The wave was received behind a hill by Marconi's brother, who communicated that he had received the signal by firing a rifle shot.

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Carolyn Sealfon

Here is the published version of "Embodying Newtonian Mechanics". Thanks for the helpful feedback from this community! http://newsletter.oapt.ca/.../embodying-newtonian…

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Kayla Anne

Is there a way to get high resolution images for the “Physics Tool Box” visuals in the textbook? I would love to print them out large to hang as posters in the room 🤗

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Karen Hunter

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This question relates to work and energy.
Suppose I have a horizontal spring and a block on a frictionless surface, and I push against the block to compress the spring.
If the system is defined to include the block, the spring, and the surface/wall, then I understand that the work done by me is positive and increases the chalk-crushing ability of the system, which we call an increase in the elastic potential energy of the system.
But then if I define the system as just the block and the surface/wall (excluding the spring), then the analysis changes because the work done by me is positive and the work done by the spring is of equal magnitude and negative, so the net work done on the system is zero and the energy of the system does not change. And I see that the chalk-crushing ability of the SYSTEM has not changed because the spring is not in the system.
But I think idea this will be hard for the students (I'll find out today!) because they will still feel that the chalk-crushing ability has been increased, because obviously the spring is compressed and it could crush the chalk.
How would you explain this? Would you say that there is more chalk-crushing ability after the compression because the spring can now do work on the block due to its compression, but that this chalk-crushing ability is not a property of the system because of the way we defined it?
Thank you!
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Kayla Anne

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Good morning! I just wanted to share a quick demo I figured out regarding the “normal” and other “support” forces when we did an introductory activity to forces yesterday. (Yes, we are just starting forces now 🫣). I am intentionally NOT naming forces “gravity”, “tension”, “normal” like I would have previously done, per recommendations in the instructor guide!
The students were instructed to place a book on a table and think about the objects interacting with the book (table, earth). They were then asked to push directly down on the book and reevaluate the interaction between the book and the table. Some students picked up immediately that the table needed to “push up” more in order to keep the book from falling down.
Other students had a difficult time with this idea, so I asked them to behave like the table, which doesn’t allow the book to move even when the hand pushes down. I placed a book in their hand and pushed down - they quickly realized in order to keep the book still, as the table does, they had to push more up! They were then able to determine that the table has to push up more just like their hand had to. 🙌🏻
While a few still struggled with their force diagrams, overwhelming students were able to correctly draw and explain how they knew the force diagram would look the way it does in Conceptual Exercise 3.1 and the Try it Yourself activity!

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Timothy Magill

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Advice question: when running ALG 7.4.1 (testing Hooke's Law), what advice do you have to help encourage students to test series and parallel, rather than (as I fear) only testing each spring individually?
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Anne Caraley

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Good day! After yesterday’s workshop on Quantum Optics I shared some ideas in the comments of Eugenia Etkina ‘s post that she has asked me to share in a new post.
It's what I do to try to get and stay organized during an ISLE workshop.
I have established a routine over past year or more:

create a new folder on my Desktop for the day's workshop, create a new plain text file opened and already named and saved to that folder for my notes (yes, I am taking notes!), cut & paste the zoom link into the file. *I usually add the Zoom link to my calendar so I can find it easily on the day.*
Fire up Zoom. *15 minutes in advance in case an update is needed*
Arrange my view into quadrants: Zoom upper left, browser with slides and other documents lower left, the chat from Zoom to the upper right, and my editor window to the lower right. (I am left eye and right hand dominant.)
First thing I add to my notes are the workshop folder and file links and also I immediately download the original starting point slides and ALG and etc. to my folder. (This is when I miss some of Eugenia's opening statements.)
I save my notes many times along the way, and any screenshots, etc.
I also download the completed slides again at the end and rename them appropriately.
* Afterwards, I then drag the new folder into my main folder for ISLE workshops that gets backed up with everything else periodically. *

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Rebecca Becka Pouy

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Some of my students were hoping I had more practice problems they could use to identify what kind of energy is present in energy conservation problems. Does anyone have a good worksheet of some that they could share?

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Bor Gregorčič

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I just thought I would drop this here and ask people to reflect on how abductive reasoning relates to the ISLE process. I have stumbled upon this term before, but haven't really reflected on it. #feelingtheoretical 🙂

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UVY9ygfPAkaa_h7RNgpjm5Vzu_yXxmKf-q7P95t7b1f24-FzcXLEVsovpvEoI6N3DcoAZwcCe&__tn__=%2CO%2CP-R

Timothy Magill

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I've seen others ask about incorporating ISLE into AP Physics C (i.e., calc-based). Eugenia Etkina (and others), if students have completed AP Physics 1 and have interest and time for another year of HS physics, what is your guidance for AP Physics 2 vs. AP Physics C? What would a flow chart look like?
I am leaning toward AP2 over APC for most students, as it will permit students to encounter a broader swath of physics. As I understand it, many/most colleges & universities require physics and engineering majors to retake calc-based physics, without regard to their AP C score. I think this makes AP C less beneficial than AP2 for those students, who are also typically the students who'd be inclined to sign up for AP C, due to status-seeking or wishing for deeper math.
What are your thoughts?

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Christina Friddle

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Multiple Choice Question in chapter four #14 on page 110 in Explore and Apply about friction on inclined planes has c) as the answer. Could it be a)? or is it both because of the wording.
Thanks for any opinion.
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Kayla Anne

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(I feel like I ask a lot of questions 🤣)
1. I know a new textbook is coming out this August 🎉 is there any discussion of a conceptual based textbook? (Sort of like Paul Hewitt but ISLE-style)
I am at a point where I'm adapting material from the OLAG for my students, who are struggling to complete even simple algebraic problems. (I may have to just do a lesson on

solving 1 and 2 step equations.) I know I found a “conceptual approach to Newton’s second law in the files and it got me thinking how there is a definite need for concept-based book! My students and I have started reading (and interrogating) the textbook together after they have read the section once with a partner, but I know some of my learners (especially with reading disabilities) struggle to make meaning from the text even with the second exposure to the text and completing the activities before.
2. Regarding the ALG/OALG: we have the 2014 edition at my school and the activity numbers don’t match the instructor guide. I know I have seen updated versions of the non-online ALG under the files, but only for some of the chapters (1, 2, and maybe 4 & 5?) and then all of the OLAG chapters.
I want to do as much hands on as possible, so I’m either having to cut and paste from the 2014 edition of the ALG or making adaptations to the OLAG. Is there an updated version of the ALG I can either buy or find somewhere that isn’t the OALG? (Whatever is referenced in the instructor guide is what I’m looking for I think!)
3. Have you ever thought about an ISLE certification for teachers? Like a more formal program/workshop teachers could take for credit or PDPs? Just wondering!
Thank you!!

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Eugenia Etkina

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Hi all! Thank you for commenting on my post - 72 comments with overwhelming support for migration. I am working on choosing the best option. Nothing will happen before our next workshop on Feb 8 as I do not want people who signed up to miss it (if you have not signed up yet, and plan to attend, please do, we do not have enough people so far). After the 8th I hope to have a good answer to where we are going. So, for now, continue checking the posts, post your own and share your achievements and challenges! If you have a specific topic you would like me to post on - please say here. My content-based posts have very few views, so I am reluctant to do it, unless there is a specific question/ concern. Please share! And thank you all enough for your response yesterday. It was amazing to read the comments.

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Timothy Magill

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An anecdote about the general effect of students learning via ISLE: I have a few students in my ISLE-based AP Physics class who are also in my old-fashioned, note-taking precalculus class, including a student I'll call M. M began the year with a bad case of learned helplessness. In both classes, she would loudly proclaim "I have no idea", or even, "I literally have no idea!" In the past week, I have observed her leading (!) her physics table group with remarks such as "what if we try...", and carrying over into precalculus, where I've heard her correcting a partner student, saying things such as "you know this! Now come on, look at what you've done..."
Even if one or more years in the future she does not remember specifics from physics or precalculus, I'm willing to bet she will still carry this newfound strength.

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Eugenio Tufino

Hi!
I'd like to share something that might be of interest to all of us. I hesitated initially, worried it might come across as self-congratulatory, but I realize there's nothing unusual about this situation—it's very likely happened to all of us, especially in this community. I think the questions it raises are relevant and general.
Yesterday, I received an email from one of my former students (she still has three years of high school left), a very bright and attentive learner. She wrote about how much she misses the hands-on, exploratory physics experience we had last year using the ISLE approach. Unfortunately, her current classes don't offer that kind of engagement, and she's eager to keep her passion for physics (and math) alive on her own.
Until about six years ago—before I discovered ISLE—I often guided motivated students toward more advanced textbooks, popular science resources, online lectures, astronomy-based exercises, and encouraged them to learn Python or work with Arduino, etc. etc.

However, the situation feels different now. I'm no longer in the classroom, and I wonder how to adapt the ISLE approach for an individual learner.
Also, the rapid spread of AI tools makes me reconsider which abilities I should be recommending she focus on.
Big questions indeed!
Experimentation & ISLE at Home
Should I encourage her to do experiments on her own—perhaps using OALGs or equipment I can lend from my kits—and check in with her periodically? Maybe I could involve other former students as well.
Has anyone here had experience with students conducting ISLE-inspired activities independently, without a class setting?
Programming in the AI time

Is it still crucial for an aspiring physicist to learn coding in depth (, or should she concentrate on conceptual understanding while leveraging AI for routine coding tasks?
Logistics & Community
She faces some mobility and community access challenges (she's from an Arabic background, and I'm unsure how easily she can connect with local resources). How can she replicate the collaborative exploration she found so powerful in a classroom environment?
I'd love to hear your thoughts or any similar experiences you've had. Thank you in advance for your ideas!

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Gorazd Planinsic

Hi everyone, I am posting an interesting article from the last issue of Physics World. I think it is very appropriate for the times we live in.

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Amin Rainy

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Dear all,
I regularly request my students to write weekly journals. I notice a common pattern among them. I taught Chapter 7 (Work Energy) and we know external work change energy of the system. They are Bio and/or Chem majors and learn first law of thermodynamics and they expand what I taught them to W+Q=Delta E(System). I know they want to make connection among their different knowleges however I am worry they mess up with first law thermodynamics and Work-Energy. Any idea can be helpful.

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Timothy Magill

Question: could a student reasonably begin the study of physics in AP Physics 2, without first having taken AP Physics 1? I'm now seeing that the answer is no. Thanks to all who've responded!

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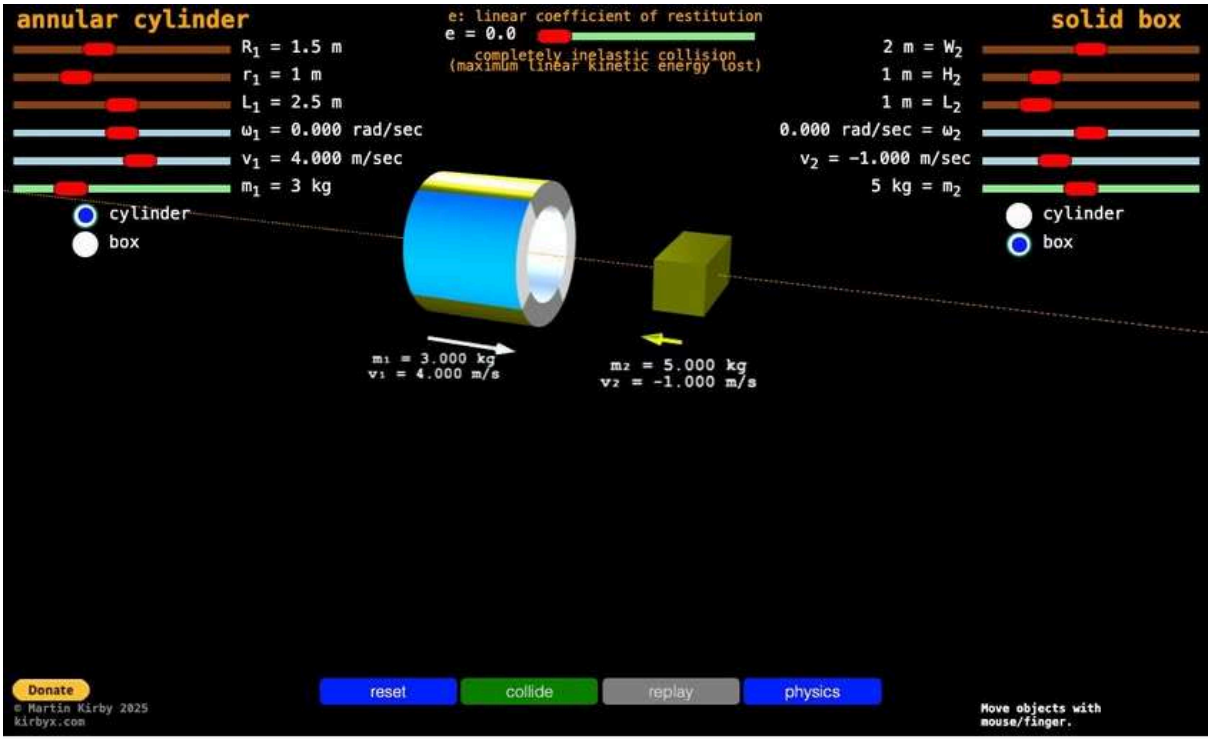
Martin Kirby

Hello everyone...
Here are two more simulations:
Mass on inclined plane with kinetic and static friction.
https://sites.google.com/.../waveadd/home/inclinedplaner2
2. Collisions: linear momentum with coefficient of restitution, and also angular momentum.
https://sites.google.com/.../kirb.../waveadd/home/collision2
They work well in any modern browser on a computer, on iPads and tablets, but phones are a bit small.
Find more at kirbyx.com
Martin Kirby…



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Sarah Anne Watkins

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We have a science position open at Saint Mary's School in Raleigh, NC if anyone is interested. We are an all girls boarding and day school. Students and amazing and it's a great place to work! If you're interested or have any questions feel free to DM!

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Karen Hunter

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Thank you for making the recordings of your workshops available! I have recently benefitted so much from the circular motion workshop. Today in class, my students had a delightful lively debate about their reasoning for their predictions for the testing experiment OALG 5.2.6 with the pendulum hanging from the scale!
We have just finished OALG 5.3.1 and 5.3.2, developing the idea that the acceleration is proportional to v^2/r.
In the workshop, it sounded like the next step was to do an experiment to find the constant of proportionality in Fnet/m=(constant)v^2/r, which should be 1. I have a few questions about this:
a) Is the idea that the students should independently determine both sides of the equation (Fnet/m and v^2/r) and see what the constant is by comparing those two results?
b) Would the "Flying Pig" be suitable to use for the conical pendulum in this lab?
Thank you!

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James Kerr

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Good morning. Ice and snow = No school today. I am looking for a video recording/record of your recent workshop on Circular Motion. I did save the slideshow that accompanied the event, but I could not find the video with teachers who attended the workshop. Is the video available? If so, where might I find the video? Our district adopted your textbook this year

My current class of 27 students is just now starting to consider circular motion. Thank you for sharing.

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Oliver Moose

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Does anyone know of any good Simulations for strong and weak force?? I could not find any!

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Andres Akamine

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Hello there, my original plan in order to include Fluids into this year AP Physic 1 curriculum was to add chapters 12-13 to the current Ch1-11 for AP Physics 1. At the current pace, it will be hard to accomplish that. Instead, I was thinking on using the new materials in AP classroom. It includes videos, an interesting lab that I am looking forward to do. The ISLE discovery concept is not there. I wonder: how my students will react to the change? To gain time, I was looking to explain gases in chapter 12 qualitatively and then cover chapter 13 extensively. Any good ideas for crunching time towards the end of the year. Currently I am finishing Chapter 8 Extended Bodies at rest. I am looking forward to hear your thoughts.

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Karen Hunter

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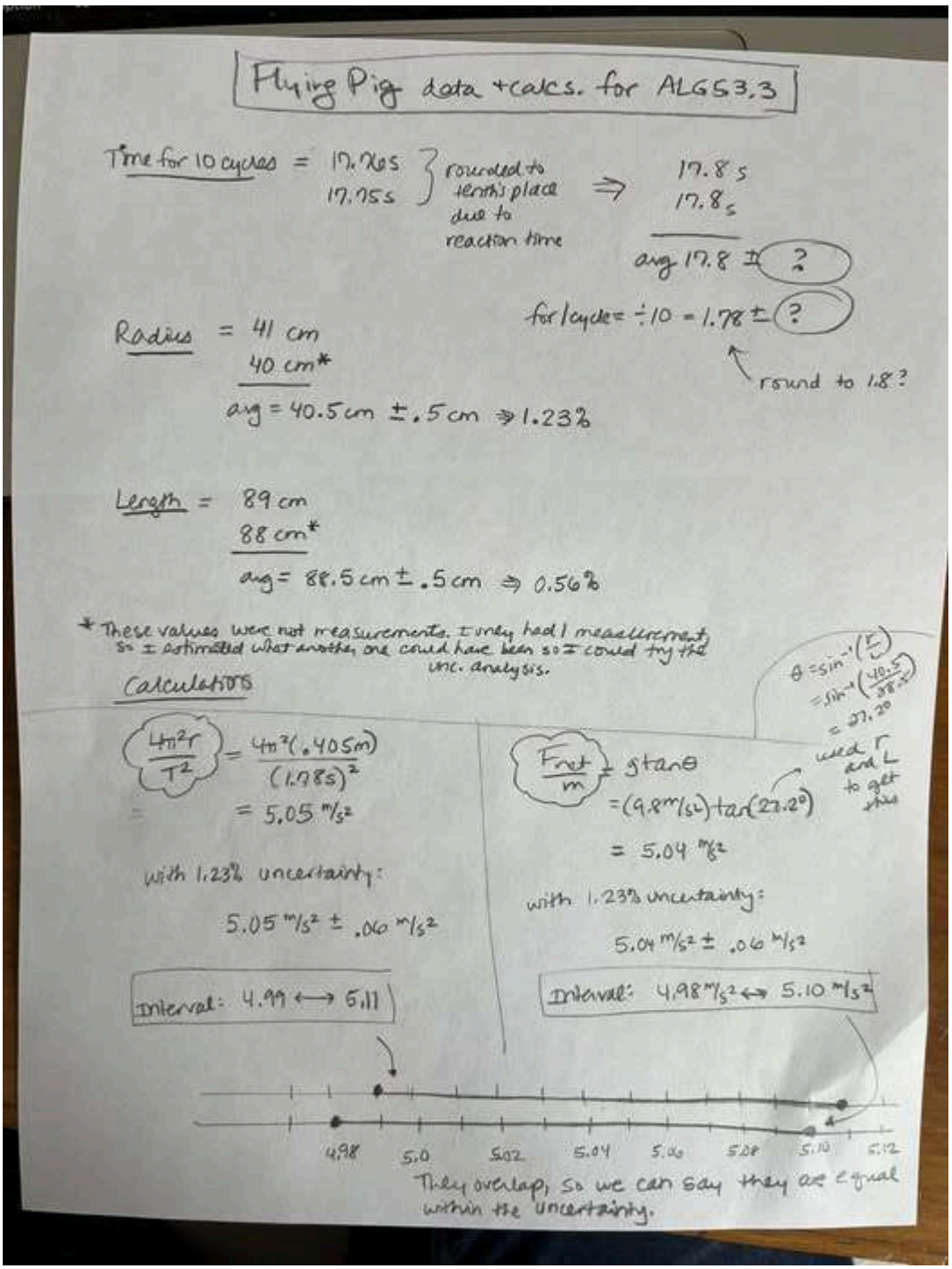
Estimating uncertainty for ALG 5.3.3 using the Flying Pig

Before doing this lab with the students, I wanted to work through the analysis myself, so I quickly took a little data. Then I watched the recording about uncertainty, and I have tried to apply what I learned there. Data and calculations are in the photo attached.
In working this out, several question arose:
I took two measurements for the time for 10 periods, and the stopwatch read 17.76 s and 17.75 seconds for these measurements. I rounded these to 17.8s and 17.8 s because the reaction time would be in the tenths place. How do I estimate an uncertainty for this time for 10 cycles since these are the same, and I already have rounded them more than the instrumental uncertainty. Would you use plus or minus 0.1 s? And then when you divide by 10, now the value for the period is 1.78 plus or minus 0.01 s?
For the calculation of the acceleration using 4pi^2r/(T^2), I calculated 5.05 m/s^2. How do you decide how many significant digits to round the calculations to? i.e. Should it be expressed as 5.05 m/s^2 or 5.1 m/s^2?
If you see anything in my analysis that should be done differently (in addition to getting real data for more trials!), please let me know. Thank you!



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Marianna Anthea Bannon

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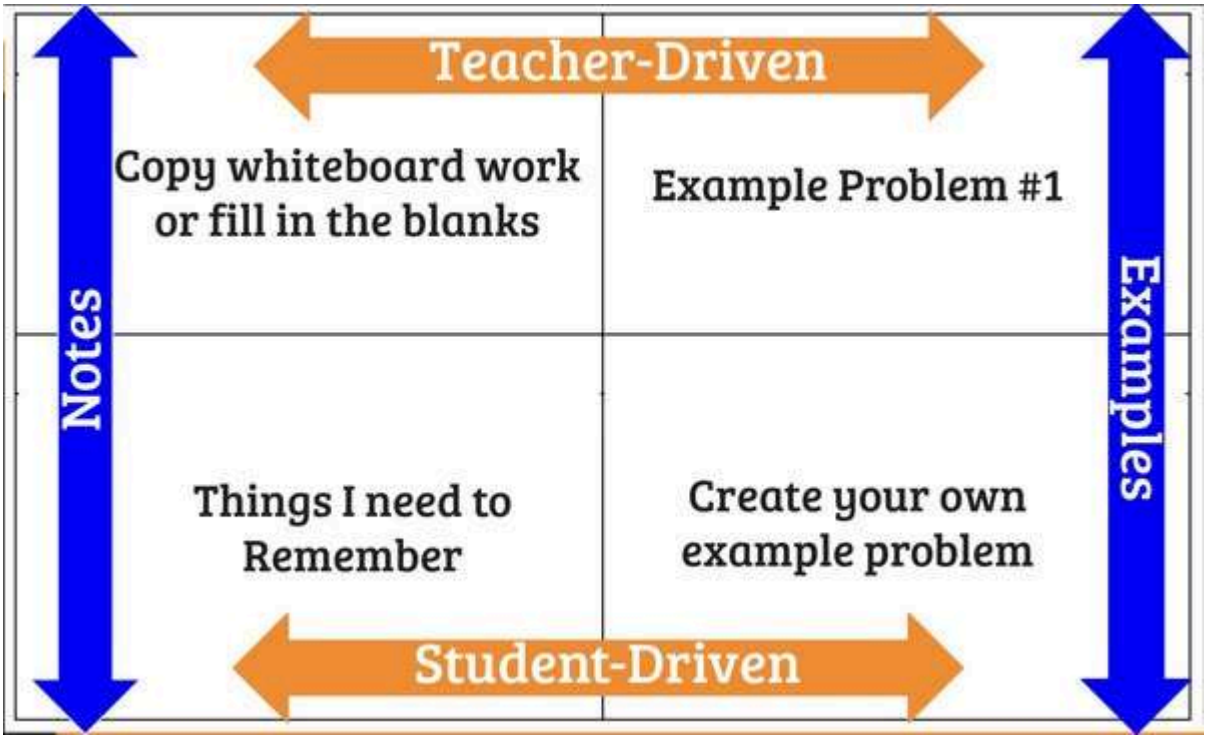
Notes?
Hey all, I don't know if everyone just uses the ALGs for their students to fill out during/after cycles, but this is my take on notes for students. I learned about a cool idea/template from Peter Liljidahl, author of Building Thinking Classrooms where students actually make their notes on whiteboards and it becomes a collaborative activity first, and independant second. I only have 50 minute periods, so I can't quite use his model alongside ISLE, but I've used the main ideas to create these templates for students. You'll notice that at the bottom of the notes page is the direction to interrogate the text and revise their notes. I think this has worked fairly well with my students!

Super important: We do this AFTER we finish the lesson for the day! So students do all the whiteboard work etc and this is the last 5-10 minutes + homework.



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Amin Rainy

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Dear all among the following assessment tests which one do you think is better for measuring students' learning gains in the Wave topic by using ISLE pedagogy? Thanks for your prompt reply. Eugenia Etkina
Mechanical Wave Conceptual Survey (MWCS)
Wave Diagnostic Test (WDT)
Wave Concept Inventory (WCI)
Source:

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Martin Kirby

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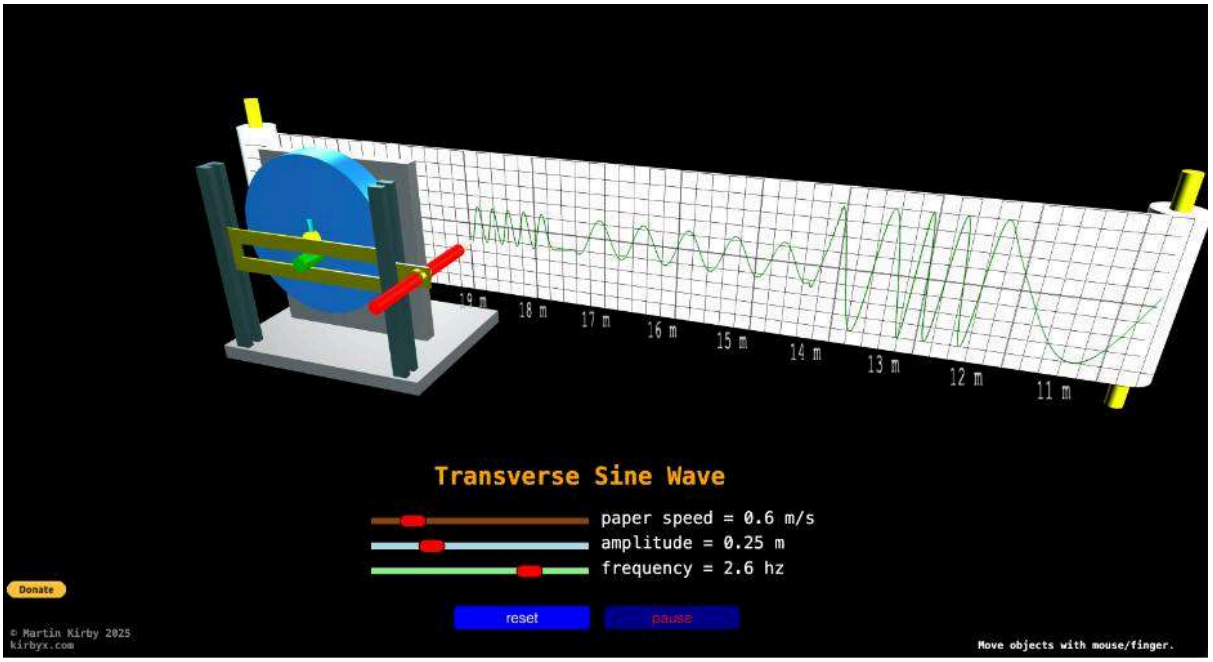
Hello everyone...
Here is another simulation that you may find useful. It's simple: a machine that draws a transverse sine wave on moving 'paper', where the user can vary the frequency and amplitude of the wave, and can vary the wavelength by changing the speed at which the paper moves under the pen. Great for figuring out the relationship between wave speed, frequency and wavelength.
The simulation also demonstrates the connection between a point moving in a circle and the sine wave.
It's in 3D, so you can drag the machine around with a mouse or finger for different views.
It's free, no strings, and works on pretty much anything that can use a modern browser (chrome, firefox, safari, opera etc). If you download it, the simulation doesn't require an internet connection.
To run WaveMaker online:
https://sites.google.com/a/kirbyx.com/waveadd/home/wavemaker
To download WaveMaker:
https://drive.google.com/.../11C94e65OhVn52FcBh0A.../view...
Take a look at my other simulations:
kirbyx.com
Thank you for your attention... happy teaching (physics, of course).



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Eugenia Etkina

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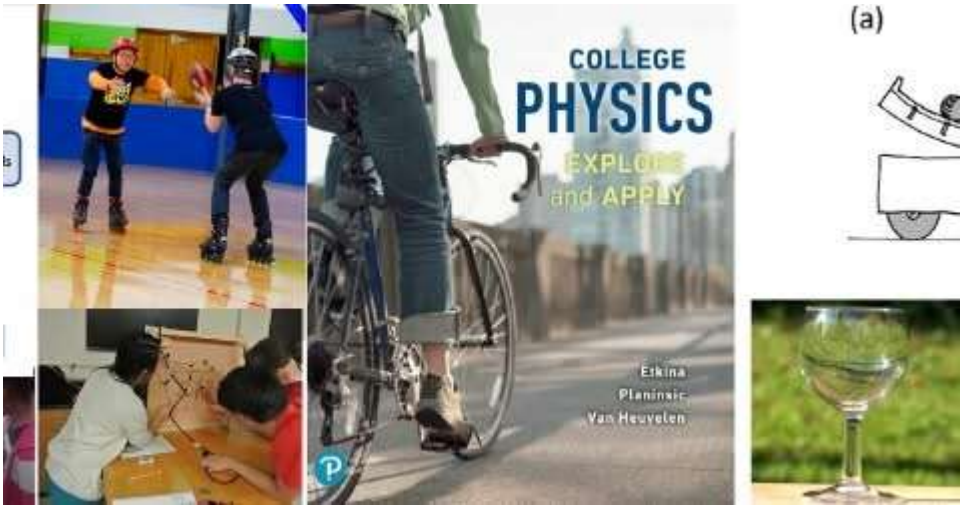
Hi all, this community left Facebook and is using a new platform (secure, free of adds, and is not owned by despicable people). It is much better organized and easier to search.
Here are the instructions for those who want to join the new platform.
How to Register for the ISLE Physics Forum
Welcome to the ISLE Physics Forum! Follow these steps to join our community:
1. Go to the Forum:
Visit islephysics.net/forum and click 'Register'.
2. Accept Forum Rules:
Review and agree to the guidelines.
3. Complete the Registration Form:
- Username (Display Name): Choose a recognizable name (visible only to registered users).
- Email Address: Enter a valid email (used for login).
- Password: Create a secure password.
- Required Questions: Provide your location and explain why you wish to join.
4. Complete CAPTCHA:
Confirm you are human.
5. Submit and Activate:
- Click 'Register' to submit.
- Check your email for an activation link and click it.
6. Log In:

Return to the forum, click 'Login', and enter your email and password.
7. Join the Conversation:
Start exploring topics and participating in discussions!
ISLE Physics Forum | islephysics.net/forum



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Eugenia Etkina

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Hi all, if you have not visited the group in a while or were just admitted, we left Facebook. The instructions how to join the new platform islephysics.net/forum are pinned to the top of this group. We will see you there. Fluids in Motion workshop is on March 8th at noon East coast time. 2 hours. See EVENTS here or on the new platform. Almost 200 people already joined.
https://www.facebook.com/groups/320431092109343/posts/1819111392241298/?__cft__[0]=AZVGU0p0k-hzvUixYY1xuIf_SMPjfgV9-5rH06X8_I-knSj76X9MlE76gCe_TP92Nhl2fBjauAU-q2to93clQJHk4H2gNrptkkyzTmkxeaCUhQuh9iwiF1cH5_Q5qUKw_Cx0Jw5AoWGldl6xOnbV0SzggL-NzmgvBGtk8jhphQCLwtUYfPFMKvHGC8Ta2rIorYDBAI70-seSU-YCamwCEVjC&__tn__=%2CO%2CP-R

Eugenia Etkina

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Hi @everyone. Over 10 days ago the community moved to a new platform. Those who missed the instructions how to move - see the post pinned to the top of the group. The new platform is superior to this one and does not belong to anyone but us. Please follow instructions and join if you are interested in being a part of this community. Our next

workshop is on March 8 at noon EDT. Teaching Fluids in Motion through the ISLE approach. See you all there. The info is on the new platform and here in the EVENTS. I will continue to post announcements about the new platform but will not make any other posts or reply to questions. Time to go, people, time to go!

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Eugenia Etkina

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Hi all, our community migrated to a new platform. The instructions are in the post pinned to the top of this group. In case you did not join the new platform, I am posting the link to the registration form for the introductory summer ISLE workshop in the summer. It is free. 8 hours, 2 days. on zoom. July 15-16 starts at noon EDT. Here is the link to register.

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Eugenia Etkina

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Hi all, I continue to admit new people to this group but we no longer operate here, please go to https://islephysics.net/forum/ to join our new platform. The instructions on how to do it are pinned to the top of the group. Please ask your questions and share your comments there. I really want to move away from any system that collaborates with the power.
https://www.facebook.com/groups/320431092109343/posts/1825991584886612/?__cft__[0]=AZXXZEHDwvyF1xfJSJaV-6ON2w66KRAFYY_fLJXBVS8tYAOCfijqDcli4h7-THSXV1t4Ry8Njwl378lgJVmHD_H0EmfwVkEBHAfiBy-GzC-7IUFqdSJLiqhxBQoKnQdjLknI01YTIpgfso58NvqknAqhNk6mmMxZHbIGcdrYMTDHVK9KssVX9MdEoWEngQg3MMOl4TTiTdZ7KyucQmWNBOXl&__tn__=%2CO%2CP-R

Diane Crenshaw Jammula

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Hey y’all! Any NYC teachers using ISLE? I know some teachers looking to connect. Posted on the forum as well. Cheers!

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