



Integrating Energy, Equity, and Place in High School Physics

Community agreements + Getting started with energy

Day 1 | Mon Aug 1, 2022 | 12-2 PT / 3-5 ET
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Purpose of this session

In this session we will

- **Make community agreements for our work together**
- **Adopt a shared language and representations for energy in physics to use in future sessions**

Community agreements

Facilitator: Tali H.

Format: Discussion

Time: 1 hr

Instructions

- (15 min) Individual Reflection: What do I need to fully engage in the workshop? What is important to me in terms of discussion, disagreements, differences in perspective, etc? Post here [E&E 2022 Community Agreements](#)
- (15 min) Breakout Session: Develop a set of recommended agreements. [E&E 2022 Community Agreements](#)
- (15 min) Group Discussion: Finalize the community agreements.

Group 1 (facilitator: Jaime)

Asher, Rory, Rachel, Julie, Maajida

- Breakout room community choice (private think time, work with others/new groups, work on writing curriculum or lessons) - groups by interest
- Try to have the camera on, but we are all adults so if there's a need to attend to do that!
- Speak your truth.

Group 2 (facilitator: Nora)

Adrien, Ari, Nifemi, Andy, Paul, Kristin

- Allot time to think through ideas
- Camera on if possible and engage as you can regardless of camera status
- Allow multiple ways for people to ask questions. (Session doc? Zoom chat? Outloud? Small groups?)
- Relevant links put into the chat, session doc and portal
- Give space to make mistakes. Own up

<ul style="list-style-type: none">● Allow people to speak on ideas that are not fully formed, be receptive to feedback that points out if a comment is “ouchy”.● If someone does not have pronouns next to their name, use the person’s name to refer to them in the third person always.● If you do slip with pronouns, apologize and don’t make it about yourself.	<p>to your mistakes when they cause harm.</p> <ul style="list-style-type: none">● Actively encourage people to share their rough draft thoughts, help people build on their ideas.● Trust each other to do what they need to do to take care of themselves (eat, drink, go to the bathroom etc)● Be open to new ideas● Acknowledge the diverse experiences and classrooms people come from.
<p>Group 3 (facilitator: Jim) Helene, Jolai, Ariel, Emily, Kate, Shawn</p> <ul style="list-style-type: none">● Freedom to speak in rough draft form about these tricky subjects; space to think out loud.● Allowance to turn off camera to stretch/eat, etc, but hopefully keep them on most of the time.● We need time, perhaps with visual cues, to process what this can mean/look like in our classrooms● Perhaps time for us as individuals to display what we are best at, to boost our confidence in things we feel we do shine as brightly in● Explore deeply the aspects of teaching that aren’t directly content knowledge related; instead, bring new ideas into existing content	<p>Group 4 (facilitator: Trà) Elizabeth, Gareth, Mark, Heather, Vincent,</p> <ul style="list-style-type: none">● Discussing the intentions behind setting up an agreements (such as putting camera on), giving people choice/freedom to decide● Be mindful of our air time, but also be mindful when someone coming on and deferring, and prioritize their chance to speak (i.e. raising voice when you see someone miss their talk turn)● Assuming good intents● Expectation that we can ask questions in zoom chat (having the host/facilitator to respond)

Proposals

(Rachel taking notes)

- Our hope in doing community agreements, is to ensure everyone who wants to participate can do so with as few barriers as possible. That means everyone should know the practices of the group and have a chance to contribute their practices to the community table.*
- The two-week workshop will include significant time to process what you’re learning and develop what you want to do in your own classroom. (Almost the entire second week.)
 - If a facilitator mutes you, it’s not because we don’t want to hear from you! It’s just to reduce background noise.
 - Everyone should feel free to stretch, eat, turn off camera for a bit - self-regulate to keep yourself refreshed. Cameras on makes some feel more connected, but we respect your choice.
 - Be mindful of our air time, but also be mindful when someone coming on and deferring, and prioritize their chance to speak (i.e. raising voice when you see someone miss their talk turn).
 - Know when to step back, know when to let someone else step up.
 - Actively encourage people to share their rough draft thoughts, allow people to speak on ideas that are not fully formed, help people build on their ideas.
 - Some people find the chat distracting so let’s not use that as a space for a whole other conversation.
 - Logistics and tech difficulties to Lauren.
 - Chat is a great way to participate in the conversation! (on topic.)
 - Multiple points of access for information: repeat instructions, links in the chat, everything in the session doc.
 - Making mistakes and intent vs. impact. Pronouns, half-baked ideas, ...
 - Assume the best intent but also be open to correction/feedback/hearing that you hurt someone – we want to know because we are here to learn.
 - Give space to make mistakes and own up the impact if and when your mistakes cause harm.
 - Pronouns: Need option not to identify your gender in case it’s not for you. If you are sure, putting your pronoun is supportive. If you make a mistake, just use the person’s name. If you need to apologize, just don’t make a big deal out of it, just do it quick and move on.
 - Air time - Everyone watch theirs, except Tali should talk all the time :)
 - We strongly encourage everyone to arrive on time so that we can start together. If you need to be late, we’d love for you to communicate so that we know not to wait for you.
 - We agree to attend to each other’s assets (not deficits). We will look to each other’s strengths, to what you have, not to what you lack. And the same with our students: we will speak about their assets, not problematize our students.
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 - FUTURE: Anytime you have a community agreement to discuss, please communicate directly with Tali, and we will decide what to bring up with the group.
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Getting started with energy

Facilitator: Rachel

Format: Mostly whole group, one breakout session

Time: 1 h

Slide 4: What is energy?

1. Please respond to the prompt at one of the bullet points below.
 2. When you're done, please read what others have written.
 3. Highlight, bold, +1, or comment on others' comments that stand out to you.
- Ability to do damage !!
 - Energy is something a system or object has that has the potential or ability to do something observable (*? the observable part is something new I've just added*).
 - Energy can be observed and/or stored, can change its form, and can enter/exit systems.
 - Energy is the ability to cause change in a system+3
 - Energy is represented in every science, it is how materials change.
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 - Accumulation of power over time
 - The ability to cause change. +3
 - Energy is a quantity that can describe/quantify a system's state and or/potential or interactions
 - A non-physical entity/idea used to explain changes. +1
 - Energy is the ability to change...
 - **An accounting system** that tracks an objects or multiple objects ability to create change on.
 - Energy is the ability to do work. It can take several forms depending on the physical situation. It is the ability to create change within a system. +1
 - Energy is the ability to do work
 - Energy is energy is energy... +1
 - Energy is the non-stuff that makes stuff do stuff +4 :) (the non-stuff stuff that....)
 - Work is the change in mechanical energy. (ie incomplete)
 - Anything that can do something for me.
 - The ability to do work+1
 - What about light? I don't think light does work but I do think light is/has energy,
 - Can't light be absorbed by atoms, be stored in chemical bonds and do work once it has been converted? Yes
 - Energy is a concept that has no clear definition. We describe ENERGY based on other parameter. +2 Science define ENERGY on types and kinds and interaction.
 - A conserved quantity +1
 - Energy and mass together are the fundamentally conserved quantities in the universe. +1
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 - An abstract quantity that can take many different forms
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 - Energy is the ability to cause a change in state, motion, or arrangement +1
 - There are many different "types" of energy
 - Energy is the universal fundamental quantity that enables change in physical matter

Slide 19: NGSS alignment of energy sims

The Next Generation Science Standards about energy include the following:

- **Energy forms:** At the macroscopic scale, energy manifests itself in multiple ways, such as in motion, sound, light, and thermal energy. [forms]
- **Energy conservation:** The total change of energy in any system is always equal to the total energy transferred into or out of the system. This is called conservation of energy.
- **Energy tracking & mechanisms:** Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems.

Cross-Cutting Concept: Energy and matter.
Scientific Practices: Developing and using models.
Disciplinary Core Ideas: PS3-A,B,C.

Instructions

Time: 25 min (until 1:55)

- In your breakout room, play with the following two energy sims. Take some time to check them out - they're great!
 - [Energy Skate Park](#)
 - [Energy Forms and Changes](#)
- Discuss the extent to which each of the sims embodies the NGSS energy model (stated in the box above). Neither representation includes everything... what's missing in each case? Keep notes below.

<p>Group 1 (facilitator: Jaime) Asher, Rory, Rachel, Julie, Maajida</p> <ul style="list-style-type: none">Skate park - addresses basic different forms of mechanical energy (kinetic & gravitational) as well as thermal energySkate park addresses both energy conservation and energy trackingBoxes for Energy forms and changes shows clearly the change in form and that energy cannot be created or destroyed, not as quantifiable for conservationTransfer of energy between systems is not as clear in the energy skate park simulation because there is no visualization for the thermal energy that is produced.	<p>Group 2 (facilitator: Nora) Adrien, Ari, Nifemi, Chang, Paul, Kristin</p> <ul style="list-style-type: none">The energy forms of changes why is it mechanical energy and not broken down.Missing: Forms and changes - not total energy, Skate park - transferred between objects especially with frictionWhat is happening in the forms and changes when it has a dotted line? (in the motor)Why doesn't NGSS doesn't talk about energy being transformed within one object?<ul style="list-style-type: none">We found it elsewhere in the NGSSBoth simulations especially forms and changes show different types of energyLikes: Waste energy in forms and changesIdea: Have students run energy skate park in a language in the class now one speaks, have them come up with names for things.With skate park: students get stuck up KE is increasing because they are going down/GPE is decreasing
<p>Group 3 (facilitator: Jim) Helene, Jolai, Ariel, Emily, Kate, Shawn</p> <ul style="list-style-type: none">For the 2nd sim...it is really good at displaying the 3rd NGSS standard, but leaves bit to be desired in terms of conservation b/c we can't see what is going into the system initially, it also addresses at least some of the forms mentioned in the 1st NGSSAlso, the 2nd sim uses these little colored blocks w/ an E in them, which could be tricky for those of us that are color blindFor the skate park sim, it doesn't really define the system, so it doesn't do too well at addressing the 3rd NGSS standardFor the skate park, it does a good job of the 2nd NGSS standards, but it is vague about forms, so it misses the mark for the 1st NGSS standardThe skate park also leaves a little bit to be desired in terms of energy being transferred between systems b/c we never see the thermal energy get shared, only that it magically grew bigger b/c of friction. It also reinforces the idea that friction is a form of energy and/or that is is the only way thermal energy can occur	<p>Group 4 (facilitator: Trà) Elizabeth, Gareth, Mark, Heather, Vincent,</p> <ul style="list-style-type: none">Skater Sim only shows kinetic, potential and thermal energy.Skater Sim does not mention conservation but has multiple representations of conservation (e.g., changing bar chart, pie chart).Energy Forms Sim shows all the types and but kinetic and potential are lumped together.Energy Forms and Changes is great at energy transfer and energy transform, but not as great at showing how energy is conserved.

<ul style="list-style-type: none">• Neither do a great job at defining the system•••	
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