

Patterns in Natural Systems

a biomimicry workbook
for your work (& life!)

from Regenerative Ed & Grounded Teaching



8 Natural Systems Patterns

Observe and appreciate as we connect more with natural systems. Then, we do the work of re-designing personal and work systems using biomimicry.

Alongside: Regenerative Ed Podcast Series

You'll want to be sure to listen to the episodes at groundedteaching.com/patterns that accompany this workbook so it makes sense!

Thank You!

a note from Sarah and Jess:

Hi there! Thanks for picking up this workbook– we're so happy you did! We hope you use this workbook to better connect to the beauty all around you and within you, yourself.

You're not alone in this journey of better connecting to living systems around and inside us—we're practicing noticing these patterns and incorporating them into our lives, too. And, there's a whole community who is listening to these podcasts along with you! If you want to join the conversation and connect with others, you can check out our free community by hitting the link below.

If you find this series valuable, thanks for sharing it with a friend, colleague or family member! Our work is primarily made for educators, but, as you know, a lot of what we discuss here is just good ol' "regenerative mindset" stuff.

We're offering this workshop on our podcasts to be more accessible, and, so, yes: it's fund free. That said, if you do have some extra funds and want to leave us a pay-what-you-can tip, the Paypal link is below! It helps keep our work going—thank you so much!

Lastly, remember: if all we do after engaging with this series is marvel in the beauty all around us, that alone is enough.

We love you all so much!

Sarah and Jess

Free Community

Pay-What-You-Can

How to Use This Workbook

1. For individual use

For most of us, it's probably most helpful to listen to this podcast series one episode at a time and allow that episode to simmer for a few days before listening to another (if it's out already!). It'll help you focus your attention instead of getting distracted by all the different patterns out there! If all the episodes are released and you're a podcast-binger, go on ahead and listen to them all, but it might be helpful to then go back and focus on the patterns that gripped you for whatever reason. This workbook can help you make note of the areas you really like!

You can access the series by going to groundedteaching.com/patterns

We also hope you'll find some connection and conversation in these topics by joining our Mighty Network (like facebook but without facebook!). It's a free community for Grounded Teaching and a way to respond and share your own thinking.

2. If you're reading as a group

It would be cool to set aside a time to discuss each episode, but the real juice in terms of co-designing living systems in your community, organization, school, family, etc. might come AFTER you've learned more about ALL of the 8 patterns and have done some independent thinking on each. So be sure to devote time to discussion after hearing at least a chunk of patterns.

In that way, you'll have more options for patterns to mimic without prematurely choosing a pattern to design a solution around.

If you want more support in actively designing these systems, reach out via our website or hi@groundedteaching.com and we'll connect to see if we are a good fit to help!

Also, please note that you're viewing an edition of this workbook that only goes through the first pattern, spirals. Additional editions will be released accordingly.

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Pattern 5: Lobes (not yet published in this workbook version)

Pattern 6: Cloud Forms (not yet published in this workbook version)

Pattern 7: Scatter (not yet published in this workbook version)

Pattern 8: Streamlines (not yet published in this workbook version)

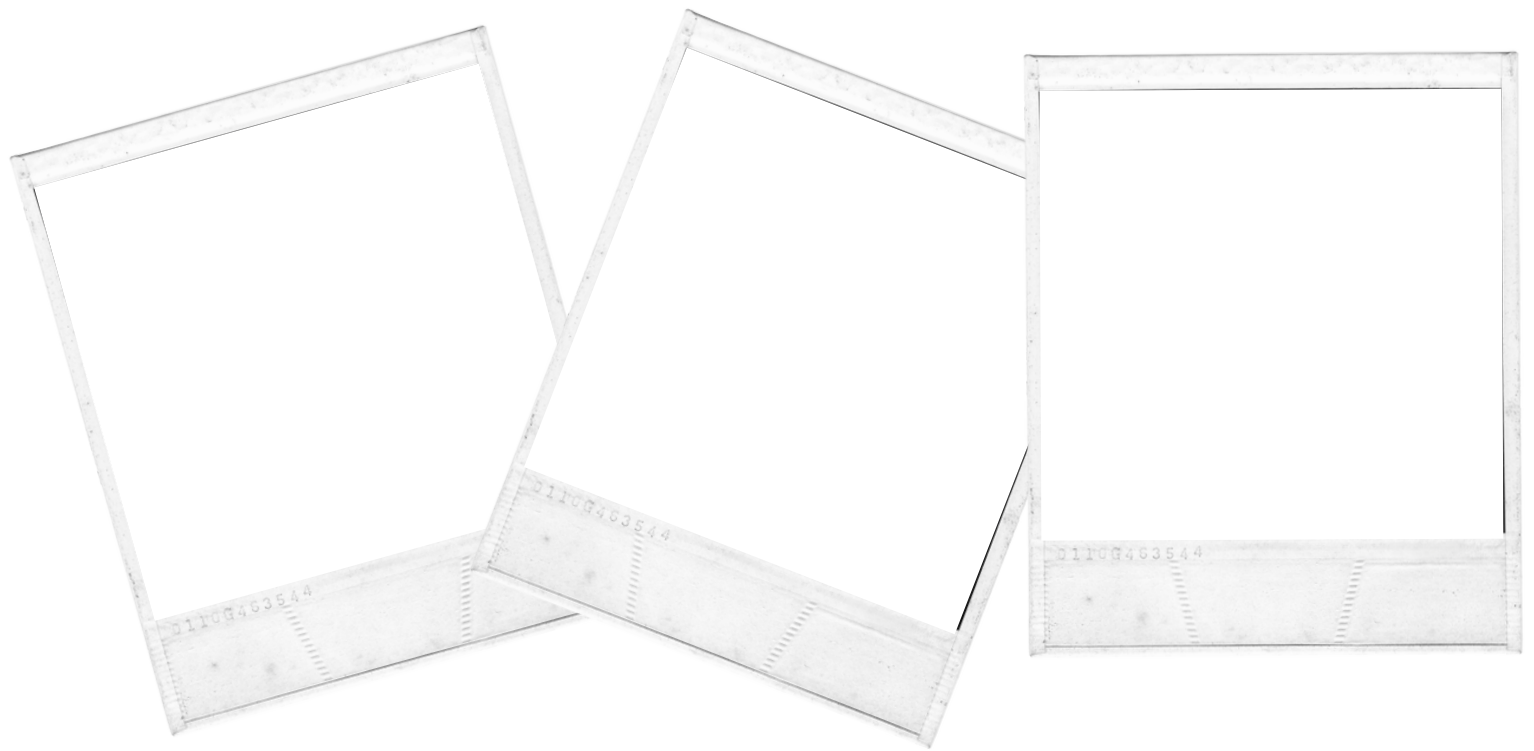
There are many ways to slice and dice and name the patterns we see in the living world. We are simply using these 8 as a way to help us with biomimicry design. These 8 have been codified in an area of study called "permaculture", but have been present since the beginning of life, really. We chose these 8 patterns because they're easiest to see, understand, and apply. They are recapped beautifully [on this website](#). This is not a complete list of all the patterns in the universe, mind you. They're just the 8 we chose to dig into :)

Natural Patterns Field Notes

In the space below, draw or list any patterns you have seen around!

What's a natural pattern look like?

Listen to the end of Regenerative Ed, Episode #33: PATTERNS PATTERNS PATTERNS!





SPIRALS!

Your initial thoughts

For use with the Regenerative Ed Podcast Episode #34: Spirals

Journal: I say the word "spiral". What comes to mind?

If you somehow mentioned a downward emotional pandemic spiral, you're probably not alone, lol.

Check out the shell of the snail pictured above. Describe the shape with words. If you'd like, take a sneak peek at all the images on the corners of the following workbook pages-- make a little word salad here with the words that pop up with those images, too.



SPIRALS!

a cosmic force of creation!

In the space below, as you listen to the podcast, you've got some space to draw yourself a cool-ass draw a spiral. Experiment with spacing, and doodle any notes that come to mind as you listen.

Did you want to stop? Or were you on a roll to keep expanding? Why might so many cultures regard a spiral as something sacred? What does that mean for you?

Let's connect!
Share your note doodle on
IG @groundedteaching with
#RegenerativeEdspirals or
share on our Free
Regenerative Ed
Community



Spirals!

Questions & Application

Maybe you're starting to see spirals all around us, now and how they can provide some helpful design functionality. Which of the four functions (protection, strength, efficiency, and expansion) hit the hardest for you?

As you practice living-systems design and biomimicry, consider an area where you notice a problem or that could use a little protection, strength, efficiency, or expansion as a solution. It might be a place where you could employ the design of a spiral, and it could be personal, work related, interpersonal, etc. Re-listen to podcast #34 if you need more examples. One is listed below.

<i>Area</i>	<i>Functionality</i>	<i>Plan</i>
I think I need more strength when I experience the first few parts of what I know could turn into a "bad day".	<i>I'm looking at a spiral pattern because it offers the strength that I might need to build up out of a "bad day"</i>	<i>When I notice I'm starting to think "this is a bad day"... do something I enjoy that's novel (blaring music in my headphones) to hoist myself out of the downward pattern as the marking point of a new, upward spiral I'll build on for the rest of the day,</i>



Spirals!

Small habits for embodiment

Tiny Habits that use the power of a spiral to strengthen, protect, and expand:

- Trace your finger in a spiral on top of your laptop before opening it to remind yourself your work is about expansion and creation, not necessarily ego or getting it done.
- As you sit down to your desk, set a timer for 30 minutes. At the 30 minute mark, you're going to roll your head as a movement to loosen up your neck. To begin, start with a tiny roll, hardly a movement, as small as possible, and then expand into bigger head rolls, releasing the tension that your neck is gripping on the inside (unwinding!). Picture unwinding any tension and simultaneously reminding yourself that your work is about expansion (unless you're sitting there because you're paying bills... then, just, uh, use this as a time to unwind the stress that's causing a tension in your neck).
- You can do the same thing with your hips. Stand up and slowly move your hips from a super small circle towards a larger spiral, expanding your hip movement like a hula hoop. See link below for a 5-minute video on this! Feel free to repeat with fingers, wrists, ankles, arms-- any rotating part of your body that could use some expansion.
- What else would get you thinking about strength, protection, or expansion?



Our favorite 5-minute Somatic Movement for Spiral Video from the SomaKinese Youtube Channel

click image or <https://www.youtube.com/watch?v=Ro44TTO-maY>

In the podcast, we reference tiny habits. We love 'em. For more reading about setting tiny habits, check out BJ Fogg's book, [Tiny Habits](#). We've used it in a number of our workshops now, and it's really a gamechanger.



Spirals!

In teaching.

Though Regenerative Ed has a surprisingly wide listener base-- folks who aren't just in education, but who are looking to do life differently--it's likely that you're here because you have something to do with educating the next generation.

Here is one way that you can run a simple classroom discussion, based on the pattern of a spiral, to expand an initial idea. This isn't the best form for ALL discussions, but works wonders for idea expansion.

- The teacher poses an excellent discussion question (this is key).
- There is an initial group of two people discussing the question at hand. From there, those two present a synthesized idea with a slightly larger group.
- The slightly larger group iterates on the idea, then shares outwardly with the next level of the group.
- The process iterates, the idea moving and expanding in a spiral, and, at the end, the final iteration of the idea is presented back to the original two for feedback on how that expanded.
- Hold a discussion about the nature of this type of iterative process, what it has to do with spirals (draw one on the board) and why it's helpful for iterating an original idea.

Let's talk about goal hitting, and we can talk about it in the context of objectives in the classroom that you want students to learn, but also it applies really to any goals we set for ourselves or others we might be teaching or leading:

Often, when we think about our current standards everyone is hired to teach, we think our students need to hit those standards within a few lessons that teach on them. We KNOW we are supposed to "spiral back" to elements throughout the ENTIRE year, and the goal is that students master the standards by the END of the year... but do we really allow for that?

Often, no. Often, we are rushing through to "mastery", and we think of our curriculum as linear. Let's stop. It's too much pressure, but on top of that, it's just not how we learn. Remember, linear is usually industrial, and we're moving towards living. A spiral is a much more natural way of cycling back towards information.

In terms of our own personal growth as an educator: Let's start to see our progress at work as a spiral, so each year, it's not a circle, it's a spiral. Each year, we are entering with an elevated look but revisiting the familiar places-- that's a spiral. I don't know about you, but just me visualizing a spiral hovering over the school years is incredibly helpful in not allowing myself to feel bored, or stuck in the same loop. I AM expanding. I AM growing.



Spirals!

It's About Relationships

How can an understanding of a spiral pattern (and the functions of strength, protection, efficiency, expansion) bring you into a better relationship with:





SPIRALS!

keep it going.

Keep a running list of spiral patterns you come across here as a practice of marveling about and connecting with the natural world.

Let's Connect!

Want more support in designing systems based on patterns or running discussions about biomimicry for your school or organization?

We would love to chat. Please reach out!



groundedteaching.com



hi@groundedteaching.com



[@groundedteaching](https://www.instagram.com/groundedteaching)



The Regenerative Ed Free Community



The Regenerative Ed Podcast



The Regenerative Ed Podcast



The Regenerative Ed Patreon



Spirals!

Podcast Resource List & Further Reading Suggestions

[How to Encourage Patterns of Abundance - PermacultureNews.org](#)

["Why Do Spirals Exist Everywhere in Nature?" by Sam Woolfe](#)

[Math Patterns in Nature- The Franklin Institute](#)

[Spirals in Nature- Robert Harding](#)

["Patterns in the Natural World and Nature as a Measure" Permaculture Research Institute \(about Fibonacci\)](#)

[Swirl by Swirl by Joyce Sidman \(a children's book, read on Youtube!\)](#)

["Why Fractals are So Soothing" The Atlantic](#)

[Patterns in Nature: Why The World Looks the Way it Does by Phillip Ball](#)

[Spirals, the Pattern of Existency by Geoff Ward](#)

[Fibonacci Sequence, Spirals, and the Golden Mean- Temple University](#)



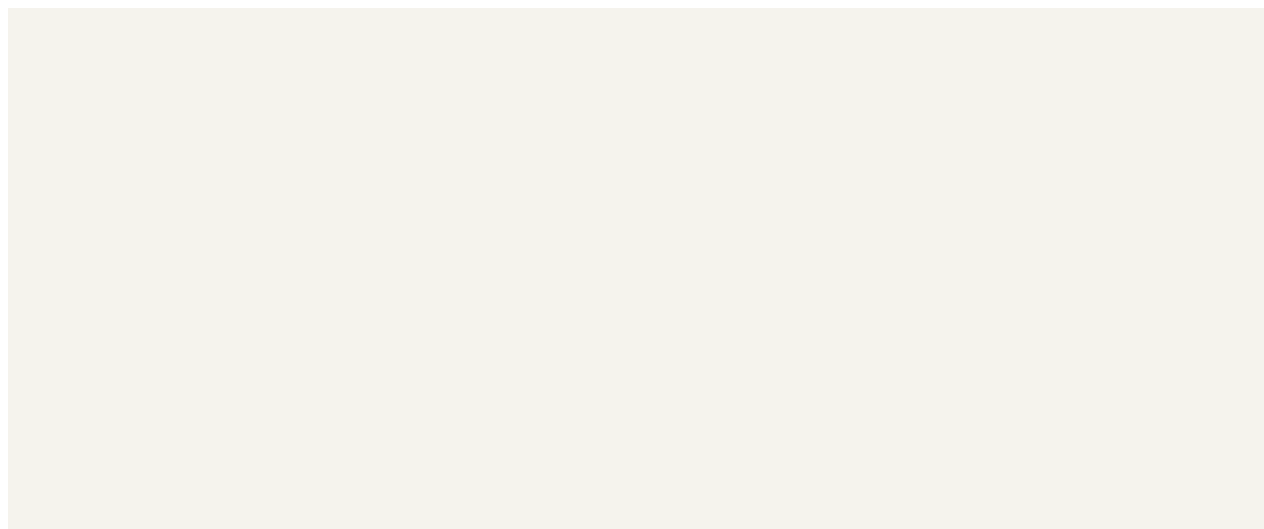
Waves

Your initial thoughts

For use with the Regenerative Ed Podcast Episode #35: Waves

When I say "wave patterns"... what comes to mind?

Check out the wave pictured above. Describe the movement with words. If you'd like, take a sneak peek at all the images on the corners of the following workbook pages-- make a little word salad here with the words that pop up with those images, too.





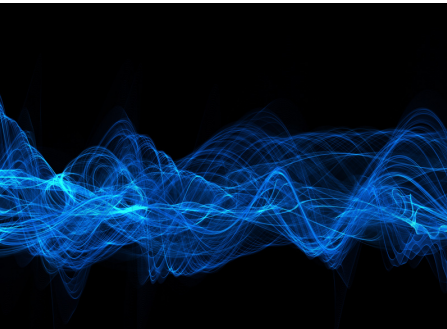
Waves

disturbance causing energy to move through a medium

In the space below, you've got some space to doodle some waves and take any notes as you listen to Regenerative Ed, episode 35 on Waves.

Waves are energy moving through a medium after a disturbance, from point a to point b. What disturbances come to mind in your own patterns in life and work that make waves?

Let's connect!
Share your note doodle on
IG @groundedteaching with
#RegenerativeEdwaves or
share on our Free
Regenerative Ed
Community



Waves

Questions & Application

Maybe you're starting to see waves all around us now and how they can provide helpful guidance when we consider the movement of energy through our systems, relationships, reactions, and more.

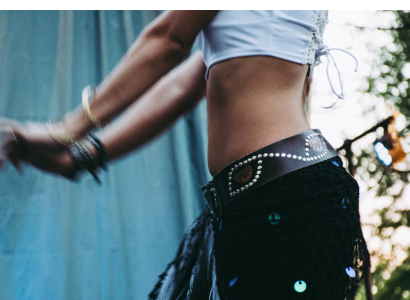
One of the major things we discussed in the podcast was how waves travel through mediums, and how different mediums can create different levels of vibrations. We spent a lot of time talking about energy waves moving through water, but that doesn't mean there aren't times where we can learn from vibrations going through other mediums, either. Get imaginative, and think about your scenarios as liquids and solids below.

Liquid

Where should I flow more freely?
Where can I allow waves to move through my molecules?
What systems should feel more liquid?

Solid

Where would it be best to have a harder reverberation? To make a louder vibration if disturbed? Consider my life, relationships, work systems.



Waves

Small habits for embodiment

Below are a few ways you can embody the pattern of waves to help you better connect to yourself as a pattern in nature.

- Start at your fingertips of your dominant hand. Holding your fingers together, allow a wave of movement to move throughout your hand. Try to make it as seamless as possible. Inhale four waves, exhale four waves, repeat.
- Start small: send a wave of energy through one finger. Expand the motion on the next wave to then include your entire hand. Expand from there on the next wave to include your entire arm. Allow the motion to move through your chest and affect your other arm, like the coolest break dancer you know. :) Experiment with getting bigger and bigger.
- Breathe in and out, picture waves of air entering and exiting like waves on a shore. Next time you're near a shore, practice matching your inhales and exhales with the waves coming in (if you can't make it to a shore, you can always find a Youtube vid of waves. It may not be the same, but that doesn't mean it isn't still helpful!)
- Become quite still, and focus, if possible, on the pulsing of energy within your body. Where do you feel the wave of your own pulse? Zero in on different parts of your body.

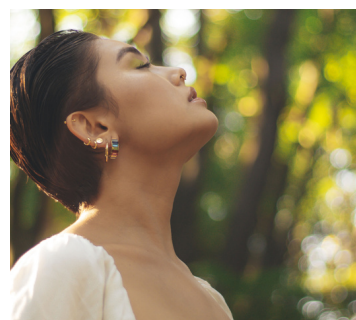
Sounds are a huge part of our world of waves that we didn't get into in the podcast. To enjoy these waves: simply turn up the tunes on your favorite song, or enjoy the soundbath video below.



Beautiful Sound Bath Video from the Reiki Amore Youtube Channel

click image or <https://www.youtube.com/watch?v=HWdhlKQaRKA>

Likewise, **light** is also a major part of our world of waves. Years back, when we were getting trained as health coaches, we learned a simple well-being tip to enjoy the light: go outside on a sunny day, close your eyes tightly, and face towards sun for a minute or two, breathing in and out. It is most powerful when used as a quick re-set in the morning. In fact, I've had my five-year-old do it a few times when it seems his morning is off to a rough start.





Waves!

In Teaching: Ripple Discussion

Discussions are waves of ideas moving through participants. There's no reason why we can't learn from waves here. Let's dig more into the wave (ripple) discussion that was mentioned in the podcast.

- Explain to the students, by way of demonstration or video and questioning, how the energy moves when you throw a pebble into a tub of water (initial big splash, ripples spreading out. If the disturbance is large enough, the ripples will bounce off of the side of the tub and head back to hit against each other and make a big splash again).
- Explain that the discussion they are engaging in today will function just like this energy pattern. The rock is the question that the teacher will lob in. They are the water, and the ripples/waves of energy are the ideas moving through them.
- Logistically:
 - (Disturbance) You will ask the big question (the rock)
 - (Big Splash) 2-3 minutes: Your students will brainstorm, whole group, as many initial thoughts as possible in a disorganized word storm as you furiously capture their thinking on the board (likewise you could also have them type it on a Padlet or Google doc, but it doesn't have the same energy as calling it out loud).
 - (First ripple) 3-5 minutes: Small group discussion: take from the brainstorm, and respond to the question with your group.
 - (Second ripple) 3-5 minutes: Smaller/partner discussion: continue to refine thinking
 - (Third ripple) 3 minutes: Refine idea independently.

IMPORTANT: This is where the teacher monitors to see if the idea has enough energy to bounce off the edges of the classroom and head back to the origin point. If it does, simply move in reverse: back into partners, then back into small groups, then back into whole group discussion to see how the idea has been refined. If the idea does not have enough energy, it's okay to end the process there. And, next time, perhaps, look for a different rock.



Waves!

In Teaching: Get Creative

On the previous page is an example of how we can use a class process that requires energy movement-- a discussion-- and how we can mimic it after a wave (instead of, say, a machine). Take a look at the following wave patterns: how might you use them to mimic a process in your class? Consider the movement of energy: that might mean

- the movement of ideas (discussions, communication)
- the movement of materials (passing out supplies)
- the movement of physical bodies
- the expectation of movement of energy (For example, in the podcast, we talked about planning a lesson around waves of energy).
- other energy movements!



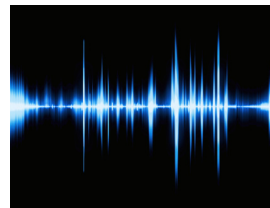
slithering snake



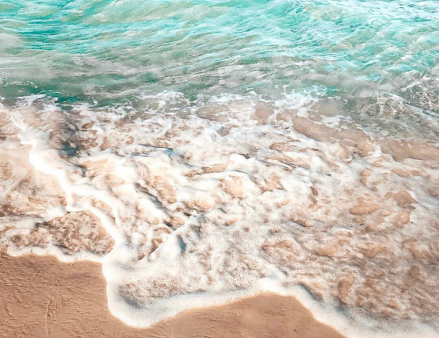
millipede leg movement



flapping flag



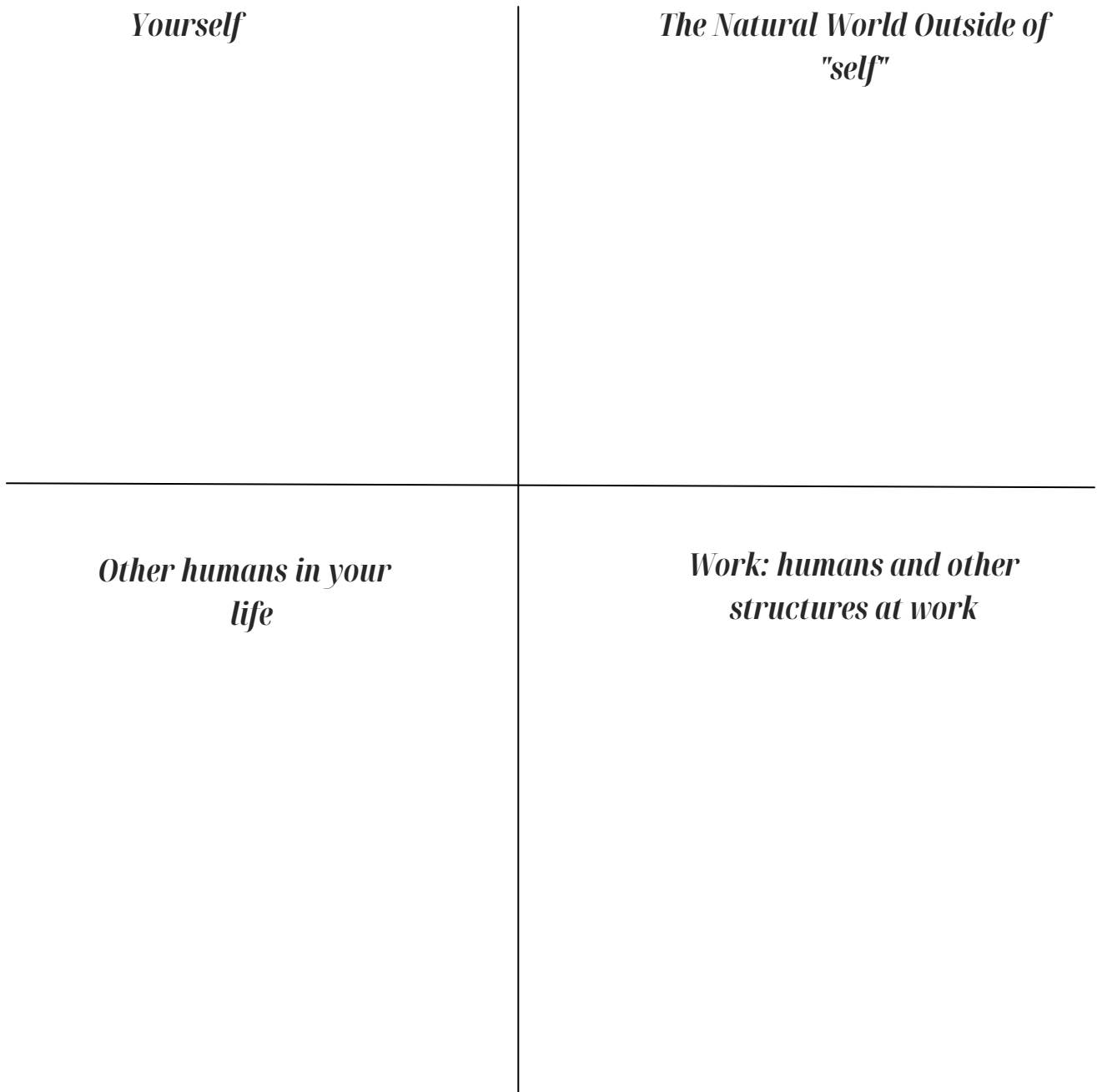
sound wave



Waves!

It's About Relationships

How can an understanding of a wave pattern (the movement of energy, caused by a disturbance, through a medium from point a to point b) help you connect to...

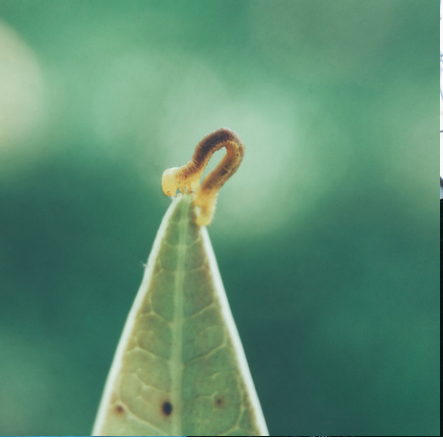




Waves!

keep it going.

Keep a running list of wave patterns you come across here as a practice of marveling about and connecting with the natural world.



Waves

Podcast Resource List & Further Reading Suggestions

["The Nature of Waves" - The Physics Hyper Textbook](#)

["Patterns in Nature: Waves and Spirals" by Douglas Barnes](#)

["Patterns in the Natural World and Nature as Measure" by Tobias Roberts](#)

[Types of Waves Course Reading University of California Irvine](#)

["Let's Learn about Waveforms" by Josh Comeau-- an AMAZING resource you might want to just play around with!](#)

Let's Connect!

Want more support in designing systems based on patterns or running discussions about biomimicry for your school or organization?

We would love to chat. Please reach out!



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