

## **Math is a hand that we all share**

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We are going to do two short guided mindfulness exercises. The first is with a finger of your hand, the second is with a mathematical idea.

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### **1. guided meditation on the tip of a finger.**

Sit comfortably in such a way that you can rest one of your hands in front of you, palm faced up and within sight. Notice the position of your elbow and forearm, the angle and alignment of your wrist and palm. Notice any tension. Take a few slow breaths and relax the whole arm, allowing the hand to shift into a more natural resting position. Keeping the rest of your arm still, stretch open the fingers to make your palm into a flat plane. Imagine a line extending perpendicular to this plane, coming out of the center of your palm, and notice what direction this line goes -- up, to the side, towards your face. Just notice the direction, it doesn't matter. Notice the strain in keeping your fingers extended and flat; feel them stretching, pushing back and away from each other. Then gradually release your fingers, allowing them to return to a natural, unstrained position. They will be partially curled, and may be touching each other.

Start with the pad of your index finger. Keep your finger, and entire hand, absolutely still throughout this exercise. With gentle and patient eyes, rest your gaze here. Notice the texture. Notice the color and light. If there is direct light on your index finger, whether from the sun or indoor lighting, try to feel the sensation caused by that light landing on your finger. Maybe there is warmth, or a tingling.

Observe the full shape of the pad and tip of your index finger, at least as much as you can see from the position of the finger and the angle of your gaze. Imagine forming a larger-than-life version of this shape from a mound of clay -- the cylindrical base, the slightly spherical pad, the unique curves as the skin interacts with the nail. Imagine making contact with each tiny area of the surface, molding it into shape.

Go below the surface of the skin, and see if you can feel the inside of your index finger. It is a mysterious mix of bone, blood vessels, muscle masses, and microscopic glands, among other things. Visualize this interior. Direct your

awareness to each nook and cranny of that interior, seeing if any sensations arise upon visitation.

Pause. Breathe calm breaths. Observe the tip of your finger. Notice how it feels.

Finally, imagine making contact with the tip of your index finger. Slowly, being careful not to disturb the stillness of your observed hand, bring your other hand up and towards it. Without touching, extend the index finger of your second hand toward the skin that you have been observing. Imagine that you are going to touch the two fingers together, but stop short of contact. Keep the fingers an inch or half-inch apart, but focus all your attention on the sensations of your stationary finger, at the point closest to contact. Imagine how it would feel if they touched. Prepare your finger for that touch, for the pressure, the warmth, the weight. Keep the fingers still, close but not touching, and notice the vivid sensations in both of them; on the surface, right below the surface, and deeper within the flesh.

Still without making contact, move your second hand away and let it also rest comfortably. Return your gaze again to the index finger of the original hand. Again, just feel the finger. Let it be still. Look, with gentle and patient eyes, and feel the finger. Clear your mind of instructions and visualizations, and just feel the finger. Stay in this tranquil state, breathing. Let the stability and certainty of the finger's feeling be a sanctuary for your consciousness. Let it teach your mind how to be still.

Notice the sensual feedback loop that has been established, from your gaze and directed awareness to the finger, and back. It is a communication, a co-arising of experience. Perceiver and perceived combine to make a whole that is greater than the sum of the parts. [optional: To pay attention is to love, and to love is to dissolve barriers.]

With a deep breath, come out of the exercise. Slowly begin to move your hand, stretching or wiggling your fingers however you wish. The end.

[stop for discussion, if appropriate.]

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What was that like?

How did your experience of your finger change, during the exercise?

How would you describe it?

Next we'll do a similar exercise, but instead of using our finger as a focal point, we'll use a mathematical idea.

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## **2. guided meditation on the mathematical experience.**

Sit comfortably in a natural position that lets your mind think and wander. Notice the location of your body in the chair, and your body in the space of the room. Imagine the contents of your mind spilling out of your head to fill the space of the room, or maybe even spreading out to fill the space of the whole neighborhood. The things you know, the things you've learned, your memories, your hopes and fears. There are uncertain and unlit parts, and there are stable and familiar parts. Just imagine spreading them all out, so there is more space, and maybe more light, than usual. Take a few slow breaths to relax your eyes and jaw, feel the space inside your head and outside your head equalize, as your mental contents and the contents of the room now commingle.

Let's choose a mathematical idea that you are comfortable with. Something simple. I suggest the idea of the integers and arithmetic. With gentleness and patience, hold this idea at the center of your awareness. Notice what it is, notice what it makes you think of. The integers. The integers. It is an idea with many facets; turn it around in your mind and observe it. Notice the mental image that may arise: a line, with negative numbers on one side, positive numbers on the other, and zero in the center. Notice the clarity or cloudiness of this image; what is in the foreground, what is left out.

Ask yourself what is three minus five? What arises in your mind, when you ask this question: what is three minus five? Visualize the symbols for three and minus and five, and the symbol for negative two. And then what is three minus six?

Enumerate the first few negative numbers -- negative one, negative two, negative three, negative four -- and recognize the interior aspects of this process. Notice the images of the symbols that may appear, the sound of the words that your mind might recite, the feeling of process and time in the enumeration of the numbers.

Deeper or behind the negative numbers, sense the number line that anchors and locates them. A straight never-ending line, marked uniformly by the numbers. Push your awareness out to the end of that line, the vague notion of infinity and eternity that rests just out of the picture, past the arrow or the dot-dot-dot ellipsis.

Imagine engaging the negative numbers in various ways, along with the positive numbers. All the arithmetic operations you might do or have done recently. The last time you calculated how much money you owe someone, or when you needed to start a task to finish on time. Feel the number line and your relationship to it, the life and drama that has unfolded on it.

To conclude, spend a little more time resting your mind on the most stable and familiar part of the idea of the integers, whatever that is for you. Sit with the idea of the integers. Let the stability and certainty of this idea be a sanctuary, for a few more calm breaths. As you hold the integers in your mind, zoom out to see if it is possible to get a perspective simultaneously on the perceiver and the perceived, the thinker and the thought.

With a deep breath, come out of the exercise. Open your eyes, if they've closed, and let your mind wander freely. The end.

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The purpose of these two exercises is to get in touch with your personal experience.

How is it different, contemplating a part of your body versus contemplating a mathematical idea?

How is the relationship between the perceiver and the perceived different?

What sensations come along with doing math, thinking about math?

What does it mean to experience mathematics?

[stop for discussion, if appropriate.]

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