# DSA Newscast

## Back to Basics: SDN

*The Dozenal Society of America is a voluntary, nonprofit educational corporation, organized for the conduct of research and education of the public in the use of dozenal (also called duodecimal or base twelve) in calculations, mathematics, weights and measures, and other branches of pure and applied science.*

**B**ACK TO BASICS will, we hope, become a regular feature of this newsletter. It's helpful, even for those well-familiar with dozenals, to review the very basics of the number base we've all come to love; and sometimes, even going back to basics will yield new discoveries. We hope that this month's column will do that, as we discuss Systematic Dozenal Nomenclature, or SDN.

There are nearly as many systems for naming dozenals as there are dozenalists; this testifies to the creativity and ingenuity of many of our number. But some degree of uniformity is also important, and SDN has the potential to help provide that uniformity. Based on well-known Greco-Latin prefixes, SDN provides an easy-to-learn, easily-recognized, and completely systematic approach to speaking about numbers in the dozenal base.

First, we require twelve new words; but don't worry, as you probably know them all, or almost all, already:

| Nil | N | 0 |
|-----|---|---|
| Un | U | 1 |
| Bi | B | 2 |
| Tri | T | 3 |
| Quad | Q | 4 |
| Pent | P | 5 |
| Hex | H | 6 |
| Sept | S | 7 |
| Oct | O | 8 |
| Enn | E | 9 |
| Dec | D | ᘔ |
| Lev | L | Ɛ |

Note that each of these words begins with a different letter, providing an easy way to abbreviate. Each refers simply to the number it's listed with. Now, however, we'll have to provide *scale*, which we do with two suffixes:

| *Positive* OOM | *Negative* OOM |
|----------------|----------------|
| -qua | -cia |

"OOM" here is *order of magnitude*, which is what these words, when mixed with these suffixes, are designed to communicate. So let's see a few examples.

$$7\ 0000\ 0000$$

A large number, to be sure; but what do we call it? "Plain English" would give us "seven gross great-gross great-gross," which is both cumbersome and ugly. There are many proposals which get us to where we need to be; for SDN, the procedure is simple. We have nine places here; neglecting the first, since it's just o (nil), we are at the eighth positive order of magnitude. Our word for "eight" is *oct*, and our suffix for positive orders of magnitude is *-qua*. So we have, here, *seven octqua*.

And that's it. Just count the number of digits except for the highest-level one, name it, add *-qua*, and you're done. There is no need to combine them (as we must do in decimal, with constructions like "hundred thousand"), either; each place can stand on its own.

Of course, while large, this is a simple number; what about a more complex one?

$$7\ 9ᘔ58\ 9Ɛ41$$

The procedure is identical; name the number, then simply list the other digits.

*Seven octqua nine ten five eight nine eleven four one.* Once we've named the order of magnitude, the role of the other digits is obvious; so there's no need to name subsequent orders of magnitude as we go down, as we do in English (e.g., "four hundred and seventy-four thousand, three hundred forty-seven"); only the top one will do fine.

Negative orders of magnitude work sim-ilarly. Take the following number:

$$0;0007\ 82zz$$

Just count the zeroes here, including the one which represents the ones place. We have four; our word for four is *quad*. This is a negative order of magnitude; our suffix for that is *-cia*. So here we have *seven quadcia eight two ten ten.* The system is literally as simple as it can possibly be.

SDN is a powerful tool, and has lots more uses than these, which we'll explore a little next month. Those interested in learning more right away are encouraged to explore our website, which has some materials available. Happy dozening!

# Dozenal News

## *The Dozenal System*, on puzzlewocky

This (undated) article gives a basic but very interesting take on the dozenal system:

http://www.puzzlewocky.com/math-fun/the-dozenal-system/

The article uses Pitman numerals, has a very well-done chart of cuneiform Babylonian base-pentqua (SDN; decimal "sexagesimal") numerals, and an excellent chart showing decimal, dozenal, unquadral (SDN; decimal "hexadecimal"), and binary equivalents. Complete with the obligatory embedded "Little Twelvetoes," it's worth touching down on this little article.

## Dozenal Quiz!

A timed quiz testing your dozenal knowledge:

https://www.sporcle.com/games/Syzygy_314159/dozenal-system

All four functions! Exponents! Three dozen questions (unfortunately numbered in decimal)! A fun way to spend a few minutes, if you enjoy testing your knowledge.

## Joseph and his Brothers: Dozenal and the Torah

Your humble editor can't speak to the theology of the article, but physicist Dr. Alexander Poltorak offers some ruminations on the dozenal base and the role of the number twelve in the Torah here:

http://www.quantumtorah.com/joseph-and-his-brother/

Very light on mathematics and very heavy on mystical interpretations of numbers, it could be interesting to learn some of his speculations on the reasons for the ubiquity of twelve in our society.

## Basic Arithmetic, Entirely in Dozenal

Your editor has been working on a text for some years, which purports to explore the entirety of basic arithmetic, from counting and numerical notation to the four functions and through logarithms, entirely in the dozenal system. It is nearing completion. The plan is for it to be available in print and PDF form, and it is complete with exercises, appendices, and all the features which PDF can offer. Keep an eye out in these pages!

# Society Business

## Volunteers Needed

As mentioned earlier, the DSA is an all-volunteer organization, and we pay no salaries. As a result, everything that we do comes out of the spare time of our members, time that they have to take away from their families, jobs, or other obligations.

We all love dozenals and enjoy assisting the Society in educating people about them; however, as the Society expands and does more, we find ourselves in need of more help.

Fortunately, the Society has a large membership with a very broad range of professions and experience. If you think you can spare any time or effort for the cause of educating the world about dozenals, please let us know:

contact@dozenal.org

You can help as much or as little as you'd like. Thank you.

## Our Next *Bulletin*

Work on the next *Duodecimal Bulletin* continues apace. Have an article? A letter containing a question (common or uncommon) you'd like answered? Send them in!

Remember that our *Bulletin* is designed to cover all aspects of mathematics, from the most basic to the most advanced, from a dozenal perspective, so no question or topic is too easy or too complex. Don't be shy!

## The Website

If you've visisted our website over the last several days, you've seen that we've added a new section to our website: Multimedia! Still sparsely populated, please let us know if you produce dozenal materials that we can add to it.

This is the first video produced specifically for the DSA, and we're very excited about it. Featuring a beautiful accompanying score and some spectacular visuals, the video shows the scale of the universe in two dozenal systems of measure, from the very tiniest to the very largest. Well worth the two blocks (an uncia of an hour, or five minutes) of time it'll take to view it. Enjoy!

## Poetical Diversion

### The Mind that Knows the Dozen

Blessings on the noble Dozen!
    We all know its strength and grace.
In the hands of those who love it,
    it can never yield its place.
Would that never Ten assail'd it,
    nor its silly Five had hurl'd;
for the mind that knows the Dozen
    is the mind that rules that world.

Silly Ten is such a bad one,
    trying hard to us distract
from the fact that lowly Five is
    useless when we wish to act;
What if we need mighty Three when
    Ten with Five is tightly curl'd?
Yes, the mind that knows the Dozen
    is the mind that rules the world.

Dozen, how divine your mission
    in Arithmetic's great field;
Keep your many factors open,
    never to the Dec'mal yield!
All true trophies of Arithmos
    are by Dozen's love impearl'd;
for the mind that knows the Dozen
    is the mind that rules the world.

Blessings on the mighty Dozen!
    whose true beauty makes us cry,
as its mighty song strikes Ten down
    from its throne usurp'd in sky!
Never shall it tempest darken,
    rainbows evermore are hurl'd;
for the mind that knows the Dozen
    is the mind that rules the world.

With thanks and apologies to William Ross Wallace.

## Donations

Members, please remember that while dues are no longer required for membership, we still rely on the generosity of members to keep the DSA going. Donations of any amount, large or small, are welcome and needed.

A donation of $16; ($18.) will procure Subscription membership, and entitles the payer to receive both a digital and a paper copy of the *Bulletin* if requested. Other members will receive only a digital copy.

To invoke this privilege, please notify the Editor of the Bulletin, John Volan, at

As members know, we are a volunteer organization which pays no salaries. As such, every penny you donate goes toward furthering the DSA's goals.

It may be worth considering a monthly donation; say, $3, or $6, or whatever seems reasonable to you. This can be set up quite easily with Paypal, which is available at our web site.

Of course, if you prefer to donate by check, you may send them to our worthy Treasurer, Jay Schiffman, payable to the Dozenal Society of America, at:

Jay Schiffman
604-36 South Washington Square, #815
Philadelphia, PA 19106-4115

Remember, too, that the DSA is a 501(c)(3) tax-exempt organization; as such, your contributions may be tax deductible under applicable law.

Thanks again for your assistance; it's your donations that keep the DSA going.

We can't keep doing it without you.

## For Sale

The DSA is pleased to offer the following for sale. These are all either at cost, or the proceeds go to the Society.

| Item | Price ($) |
|---|---|
| Dozenal Wall Calendar, 1202 | 9.05 |
| Dozenal Planning Calendar, 1202 | 8.32 |
| TGM: A Coherent Dozenal Metrology | 8.00 |
| Manual of the Dozenal System | 3.46 |
| A Dozenal Primer | 4.50 |

Prices are, unfortunately but by necessity, in decimal. If for some reason the links above do not work, simply go to: `http://www.lulu.com/shop/shop.ep`

and enter the appropriate terms. E.g., searching for "TGM dozenal" will turn up the TGM book.

We hope to offer other titles, and even some other items (such as dozenal clocks and the like), in the future.

### Each one, teach one