August 2, 2022

Announcements

August 11 (Thu) — 9 am: Graduate School "Tips and Tricks" with Kyle Shea (UW Neuroscience Graduate Program Advisor).

Date change!

August 5-7 (Fri-Sun) — Seafair Weekend

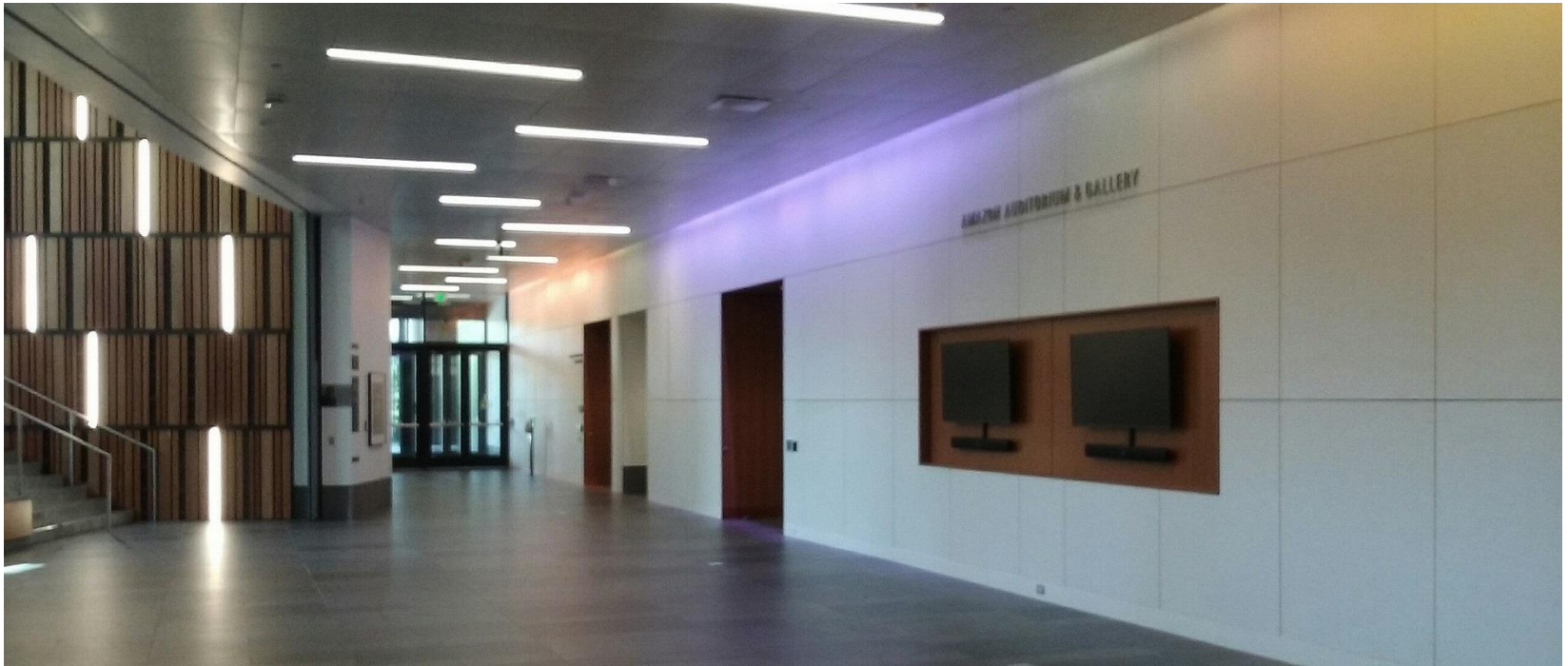
Announcements

August 4 (Thursday): Presentation rough drafts due

August 10 (Wednesday): Final Abstracts/Posters due (noon)

August 15 (Monday): Final Slides due (noon)

August 17 (Wednesday): Research Symposium
Talks: 8:30 am -12:00 pm
Posters: 1:00 pm - 3:00 pm



Review

- Scientific Writing; Reference Managers
- Figures for Publication
- Scientific Posters
- Speaking – Scientific/Public Audiences

Communicating Science to the Public

- Friends and family
- Resumes and job interviews
- Grant applications and reviews
- Media
- Inspire, educate, mentor
- Encourage people to volunteer for research studies
- Informed public

Why? When? How?

Public Speaking: You be the Judge

When watching other speakers, “score” them on the content and delivery of their presentations.

Pay attention to:

- Logical, fluid transitions and organization
- Stories/examples to engage audience
- Jargon
- Umms and Ahs
- Speed/Tone of voice
- Eye Contact / Movement
- Visuals
- Use of pointer

How to write an effective abstract

What is an abstract and why is it important?

- An abstract is a brief summary of a research article, thesis, review, conference proceeding, or any in-depth analysis of a particular subject and is often used to help the reader quickly ascertain the paper's purpose. (Wikipedia: Abstract(summary))

- Possibly the only, part of your paper that anyone will read (other than the title).

Parts of an Abstract

- All the same components as the paper
  - Background
  - Methods
  - Results
  - Conclusions

- All in ~150-350 words

- Specific format depends on the meeting or journal.

Your Abstract

- Your abstract should be **<u>300 words or less</u>**
  (the 300 words does not include the title, authors or affiliations)
- Please format using this style:

Title Goes Here (Use uppercase for first letter of each word.)
Authors (First Name Last Name), superscripted affiliation numbers
Superscripted affiliation #, Affiliation, City, State
Superscripted affiliation #, Affiliation, City, State
Text (~300 words) follows and is not bolded.

Font style: **Times New Roman**
Font size: **11 pt., Bold**
Line spacing: **single**

<u>Example</u>

Characterizing Reward Seeking Activity and Neural Activity in the Mesolimbic Dopamine System
Bre Surface[1], Daniel Elum[2], Ellen Weifel[2]
[1]Department of Bioengineering, University of Oregon, Eugene, OR
[2]Department of Pharmacology, University of Washington, Seattle, WA

Font style: **Times New Roman**
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Line spacing: **single**

How does behavior in mice change across multiple phases of reward-seeking behavior and what is the role of neural activity in the mesolimbic dopamine system during behavior? To examine this, mice were trained on a 12-day behavioral paradigm including cue-induced reinstatement and a progressive ratio task. The first five days consist of an acquisition phase in which mice learn to associate a lever press (action) and audiovisual cue with a natural food reward. Following acquisition, the cue and reward outcomes are omitted following lever pressing. During acquisition, mice increase their lever pressing throughout learning and decrease their lever pressing during extinction learning. Additionally, our data shows significant natural variability in lever pressing behavior during each phase of the cue-induced reinstatement and breakpoint level on the progressive ratio task. Additionally, neural activity in mesolimbic dopamine neurons is increased during action, cue, and reward behavioral epochs. Together, our data provide insight into how the mesolimbic dopamine system regulates motivated behavior.

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Line spacing: **single**
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Do not indent the margin.

Your Abstract:

Send to me (chudler@uw.edu) in a WORD (.doc or .docx file) by noon on August 10.

Characterizing Reward Seeking Activity and Neural Activity in the Mesolimbic Dopamine System

Bree Surface[1], Daniel Elum[2], Ellen Weifel[2]

[1]Department of Bioengineering, University of Oregon, Eugene, OR

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How long is 300 words?

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300 words = ~15-20 sentences.

Your Abstract (exceptions)

Q: Can I use my middle name or middle initial?

A: Yes. Example: **Bree H. Surface[1], Daniel T. Elum[2], Ellen Weifel[2]**

Q: What if I do not have a departmental affiliation?

A: Then use your college/university only.

Q: What if I or my mentors/PI have more than one affiliation? (Ask your mentor.)

A: Then assign additional superscripted affiliation # and add another affiliation line(s). Example:

Bree Surface[1,2], Daniel Elum[2,3], Ellen Weifel[2,4]

[1]Department of Bioengineering, University of Oregon, Eugene, OR

[2]Department of Pharmacology, University of Washington, Seattle, WA

[3]Department of Psychology, University of Washington, Seattle, WA

[4]Department of Computer Science and Engineering, Yale University, New Haven, CT

Q: What if my abstract is more than 300 words?

A: Revise it; reduce the number of words to get you to 300 words or less.

Q: What is the minimum numbers of words I can use in the abstract?

A: There is no minimum, but your abstract should have enough information to express your work.

Characteristics of a good abstract

- Precise language
- Minimum sufficient background information
- Sufficient methods
- Specific findings
- Supported conclusions

Six sentences to start

(http://www.easterbrook.ca/steve/2010/01/how-to-write-a-scientific-abstract-in-six-easy-steps/)

1. What are we talking about?

   In widgetology, it's long been understood that you have to glomp the widgets before you can squiffle them.

2. What is the problem?

   But there is still no known general method to determine when they've been sufficiently glomped.

3. Why hasn't anyone else answered this problem?

   The literature describes several specialist techniques that measure how wizzled or how whomped the widgets have become during glomping, but all of these involve slowing down the glomping, and thus risking a fracturing of the widgets

4. What is your new idea?

   In this thesis, we introduce a new glomping technique, which we call googa-glomping, that allows direct measurement of whifflization, a superior metric for assessing squiffle-readiness.

5. What did you do?

   We describe a series of experiments on each of the five major types of widget, and show that in each case, googa-glomping runs faster than competing techniques, and produces glomped widgets that are perfect for squiffling.

6. Why should I care?

   We expect this new approach to dramatically reduce the cost of squiffled widgets without any loss of quality, and hence make mass production viable.

Abstract MadLibs!!

This paper presents a _____ method for _____
(synonym for *new*) (sciencey verb)
the _____. Using _____, the
(noun few people have heard of) (something you didn't invent)
_____ was measured to be _____ +/- _____
(property) (number) (number)
_____. Results show _____ agreement with
(units) (sexy adjective)
theoretical predictions and significant improvement over
previous efforts by _____, et al. The work presented
(Loser)
here has profound implications for future studies of
_____ and may one day help solve the problem of
(buzzword)
_____.
(supreme sociological concern)

Keywords: _____, _____, _____
(buzzword) (buzzword) (buzzword)

title: "Abstract Mad Libs" - originally published 1/14/2009

Writing an abstract for a specific conference/journal

- Scope
- Audience
- Format

Examples

With 1-2 other people, identify each of the components in each of the three *Science* abstract examples:

- Background
- Methods
- Results
- Conclusions

Then: → Discuss the quality of the abstract ←

Disruption of the head direction cell network impairs the parahippocampal grid cell signal

Shawn S. Winter, Benjamin J. Clark, Jeffrey S. Taube

(1)Navigation depends on multiple neural systems that encode the moment-to-moment changes in an animal's direction and location in space. (2)These include head direction (HD) cells representing the orientation of the head and grid cells that fire at multiple locations, forming a repeating hexagonal grid pattern. (3)Computational models hypothesize that generation of the grid cell signal relies upon HD information that ascends to the hippocampal network via the anterior thalamic nuclei (ATN). (4)We inactivated or lesioned the ATN and subsequently recorded single units in the entorhinal cortex and parasubiculum. (5)ATN manipulation significantly disrupted grid and HD cell characteristics while sparing theta rhythmicity in these regions. (6)These results indicate that the HD signal via the ATN is necessary for the generation and function of grid cell activity.

Cycles of species replacement emerge from locally induced maternal effects on offspring behavior in a passerine bird

Renée A. Duckworth, Virginia Belloni, Samantha R. Anderson

(1)An important question in ecology is how mechanistic processes occurring among individuals drive large-scale patterns of community formation and change. (2)Here we show that in two species of bluebirds, cycles of replacement of one by the other emerge as an indirect consequence of maternal influence on offspring behavior in response to local resource availability. (3)Sampling across broad temporal and spatial scales, we found that western bluebirds, the more competitive species, bias the birth order of offspring by sex in a way that influences offspring aggression and dispersal, setting the stage for rapid increases in population density that ultimately result in the replacement of their sister species. (4)Our results provide insight into how predictable community dynamics can occur despite the contingency of local behavioral interactions.

Spatially structured photons that travel in free space slower than the speed of light

Daniel Giovannini, Jacquiline Romero, Václav Potoček, Gergely Ferenczi, Fiona Speirits, Stephen M. Barnett, Daniele Faccio, Miles J. Padgett

(1)That the speed of light in free space is constant is a cornerstone of modern physics. (2)However, light beams have finite transverse size, which leads to a modification of their wave vectors resulting in a change to their phase and group velocities. (3)We study the group velocity of single photons by measuring a change in their arrival time that results from changing the beam's transverse spatial structure. (4)Using time-correlated photon pairs, we show a reduction in the group velocity of photons in both a Bessel beam and photons in a focused Gaussian beam. (5)In both cases, the delay is several micrometers over a propagation distance of ~1 meter. (6)Our work highlights that, even in free space, the invariance of the speed of light only applies to plane waves.

Best practices for abstract writing

- Write the abstract last
- Everything in the abstract MUST be in the paper
- Write in concise, complete sentences
- Use past tense
- Jargon should be appropriate for audience
- Don’t include citations (generally)
- Use only common abbreviations and acronyms
- Do not refer to figures or tables in the text

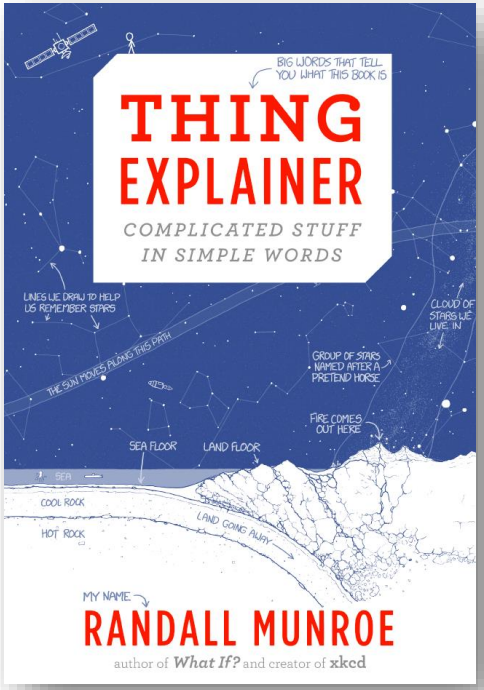
References

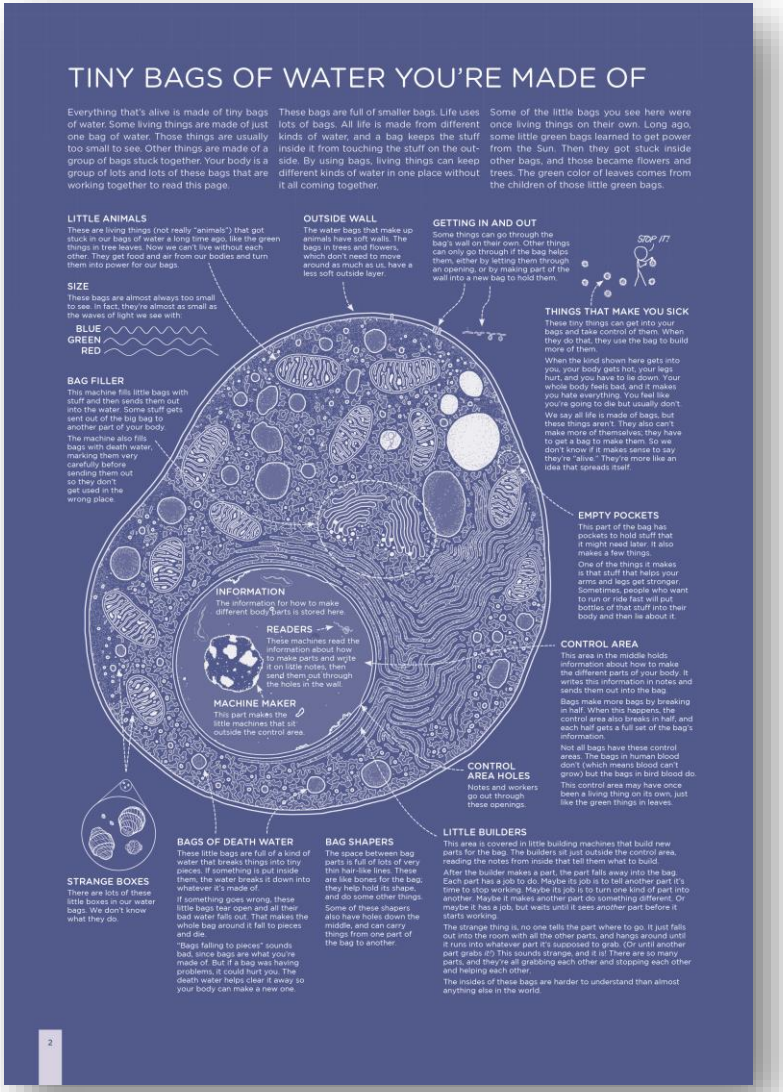
- How to write a scientific abstract in six easy steps: http://www.easterbrook.ca/steve/2010/01/how-to-write-a-scientific-abstract-in-six-easy-steps/

- How to write a good abstract for a scientific paper or conference presentation by Chittaranjan Andrade (Indian J. Psychiatry, 53:172–175, 2011.

- How to Write a Paper in Scientific Journal Style and Format: https://www.bates.edu/biology/files/2010/06/How-to-Write-Guide-v10-2014.pdf

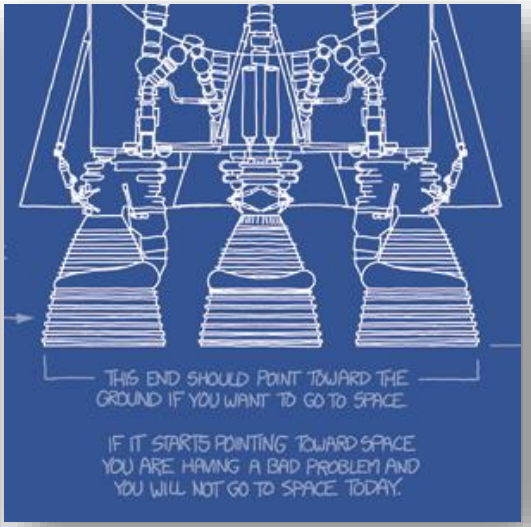
The Thing Explainer



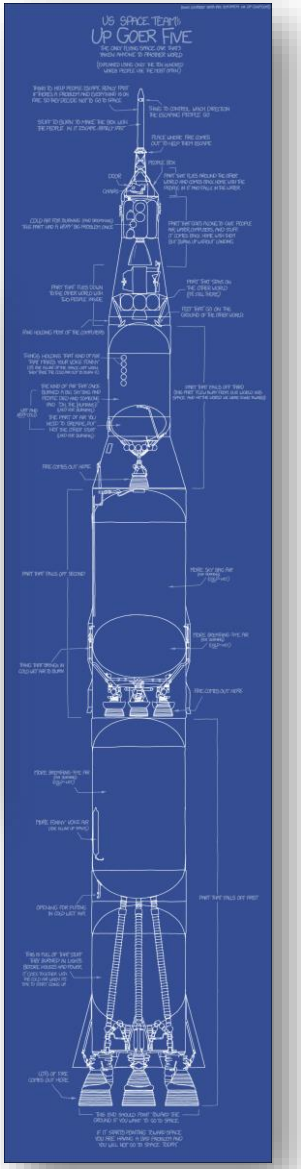


https://xkcd.com/thing-explainer/

Space Travel Simplified



http://xkcd.com/1133/



A Scientist/Engineer Walks into the Room…

Modeling Conduction Velocity After Activity Dependent Electrical Stimulation Alters Myelin Post Spinal Cord Injury

Following an incomplete spinal cord injury (SCI), axons undergo demyelination, and oligodendrocytes begin remyelinating the remaining, intact axons. However, these new sheaths of myelin result in a slower conduction velocity of action potentials partially because they are thinner. Previous research has shown that neuronal activity can increase myelination and improve gait. In this blind, pilot project, we explore whether *in vivo* targeted activity driven spinal stimulation (TADSS) has similar effects. We have seen substantial recovery of forelimb motor performance after cervical SCI with TADSS; this project examines whether faster conduction velocities due to alterations in white matter could serve as a mechanism explaining this phenomenon. We hypothesize that activity dependent stimulation will globally mitigate thinning of descending motor axons found at the epicenter of the injury and caudal to it. Eventually, we will measure other parameters that affect conduction velocity such as the internode length of myelin and more fully test the conduction speed by looking for evoked responses *in vivo*.

Advanced/Specific Vocabulary? Requisite Knowledge?

Modeling Conduction Velocity After Activity Dependent Electrical Stimulation Alters Myelin Post Spinal Cord Injury (Alexis Drake, 2015, abbreviated abstract)

Following an **incomplete spinal cord injury (SCI), axons** undergo **demyelination**, and **oligodendrocytes** begin **remyelinating** the remaining, intact **axons**. However, these new **sheaths** of **myelin** result in a slower **conduction velocity** of **action potentials** partially because they are thinner. Previous research has shown that **neuronal** activity can increase **myelination** and improve **gait**. In this blind, pilot project, we explore whether ***in vivo*** **targeted activity driven spinal stimulation (TADSS)** has similar effects. We have seen substantial recovery of **forelimb motor performance** after **cervical SCI with TADSS**; this project examines whether faster **conduction velocities** due to alterations in **white matter** could serve as a mechanism explaining this phenomenon. We hypothesize that **activity dependent stimulation** will globally **mitigate** thinning of **descending motor axons** found at the **epicenter** of the injury and **caudal** to it. Eventually, we will measure other parameters that affect **conduction velocity** such as the **internode** length of **myelin** and more fully test the **conduction** speed by looking for **evoked responses *in vivo***.

A Journalist, Kid, Your Grandma Walks into the Room…

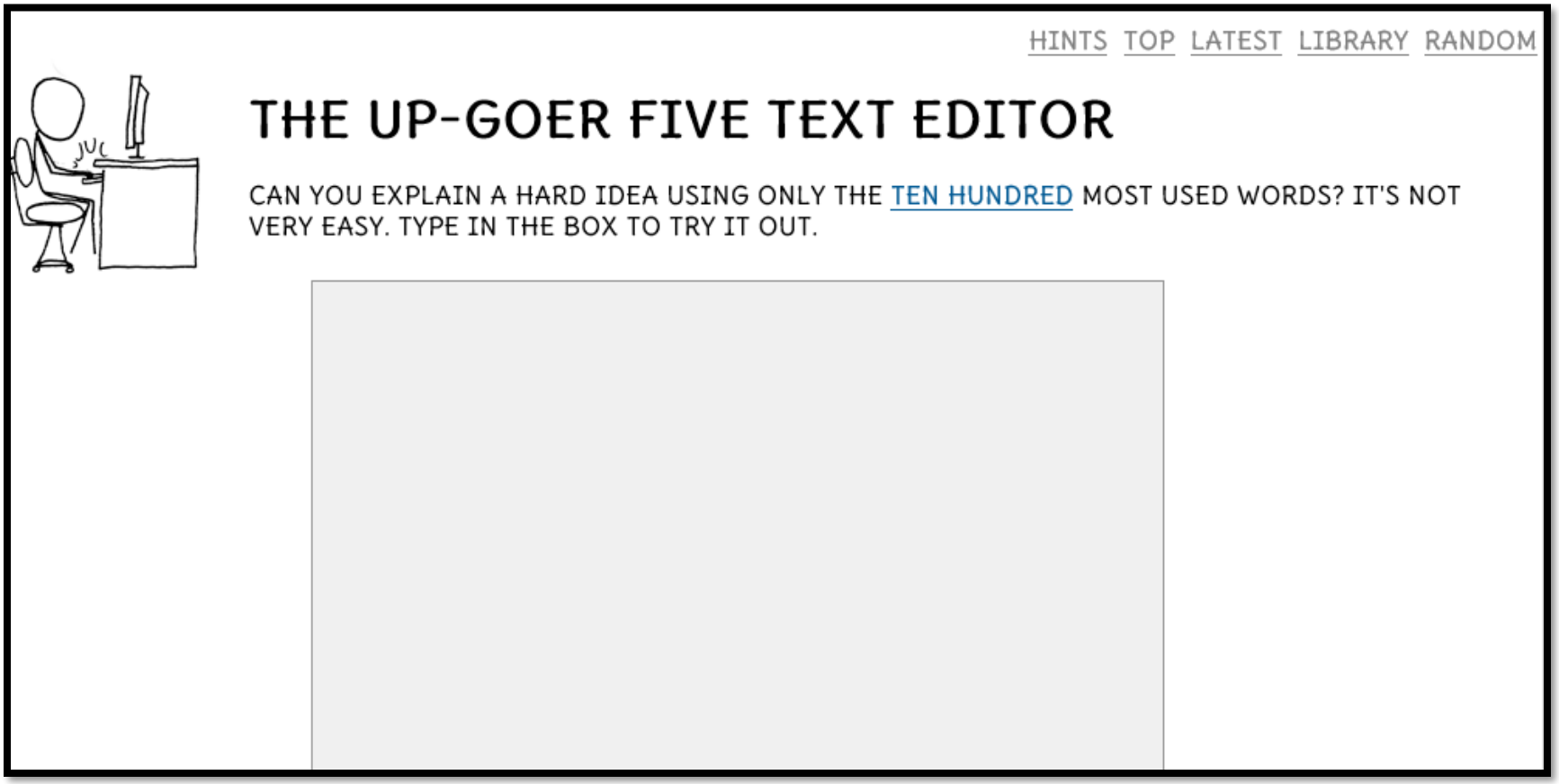
The brain controls our body. It talks through cells in our backs that go all the way to our other body parts and make them move. The brain tells them what to do like cars driving down a fast road.

When someone hurts their back, it's like a car hits another car and causes a back up, blocking the road. They then lose some control over moving their body. Cells in their back try fixing themselves. However, the new cells don't work as well. They are slower. It is like the cars have to go out of their way and use smaller roads, and it takes longer to get places.

In the long run, we are trying to see if shocking the cells in the back when a hurt animal is trying to reach for a piece of food will help them. We hope that the shock will give the cells a thicker covering because a thicker covering is like a faster road.

The Challenge: Can You Explain a Hard Idea Using Only the Ten Hundred Most Used Words? It's Not Easy!

http://splasho.com/upgoer5/



For next week!

Your UpGoer Abstracts

You will present your UpGoer abstract on August 9 during Sci. Communications Class.

Your final (“real”, non-UpGoer) abstract is due on Wednesday, August 10 at noon. This will be used in the Research Symposium Program.

Maximum abstract length = 300 words