



**Learn to Teach Online  
with your Own MOOC  
(Massive Open Online Course)**

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**Barbara Oakley, PhD, PE**  
Distinguished Professor of  
Engineering,  
Oakland University,  
Rochester, Michigan



Barb Oakley,  
Professor of Engineering  
Oakland University  
Rochester, Michigan



Terrence Sejnowski  
Francis Crick Professor  
The Salk Institute  
Professor of Biological Sciences  
University of California, San Diego



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Oakland University  
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Francis Crick Professor  
The Salk Institute  
Professor of Biological Sciences  
University of California, San Diego



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## Workshop with Barbara Oakley

**Date:** Thursday, May 7, 2015, 10:00am to 11:00am

**LESSONS FROM A BASEMENT STUDIO—**

**HOW TO MAKE A RIVETING ONLINE CLASS**

This talk describes the key elements behind the making of high quality educational videos for online learning, including scripting, filming, and editing.

For the following video, see how many bad aspects you can find. Make a list.

# Introduction to Photosynthesis

Phil “The Bad Prof” Oakley  
(You Better Hope This Isn’t)

**Your University**

# **“Zero-ith” Rule of Making Engaging Online Courses**

**Make a bad video**

# First Rule of Making Engaging Online Courses

## Make engaging videos!

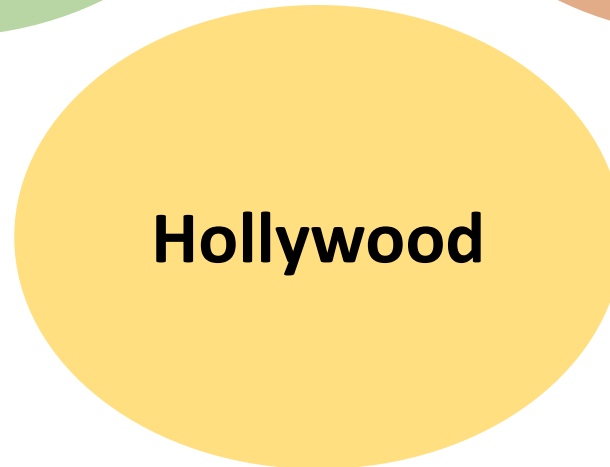
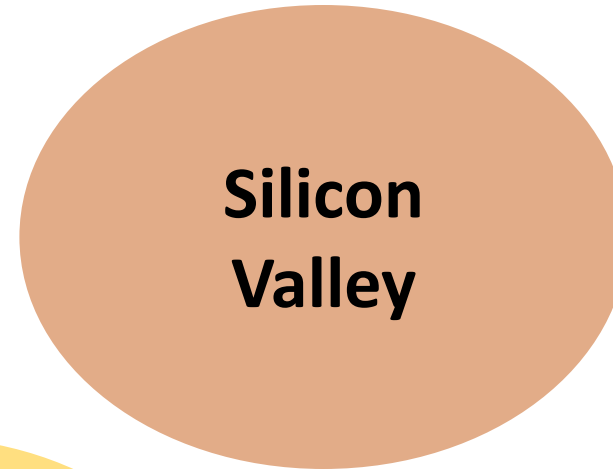
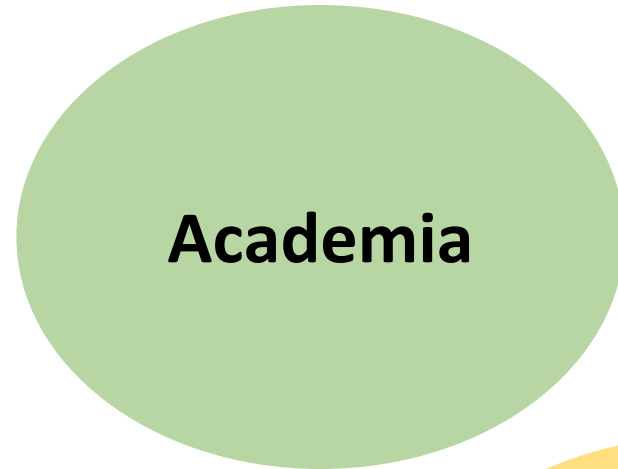
### Corollary

- *Mmhmm*
- *Vidblaster*
- *Camtasia*
- *PowerPoint*





# Online is *highly* competitive



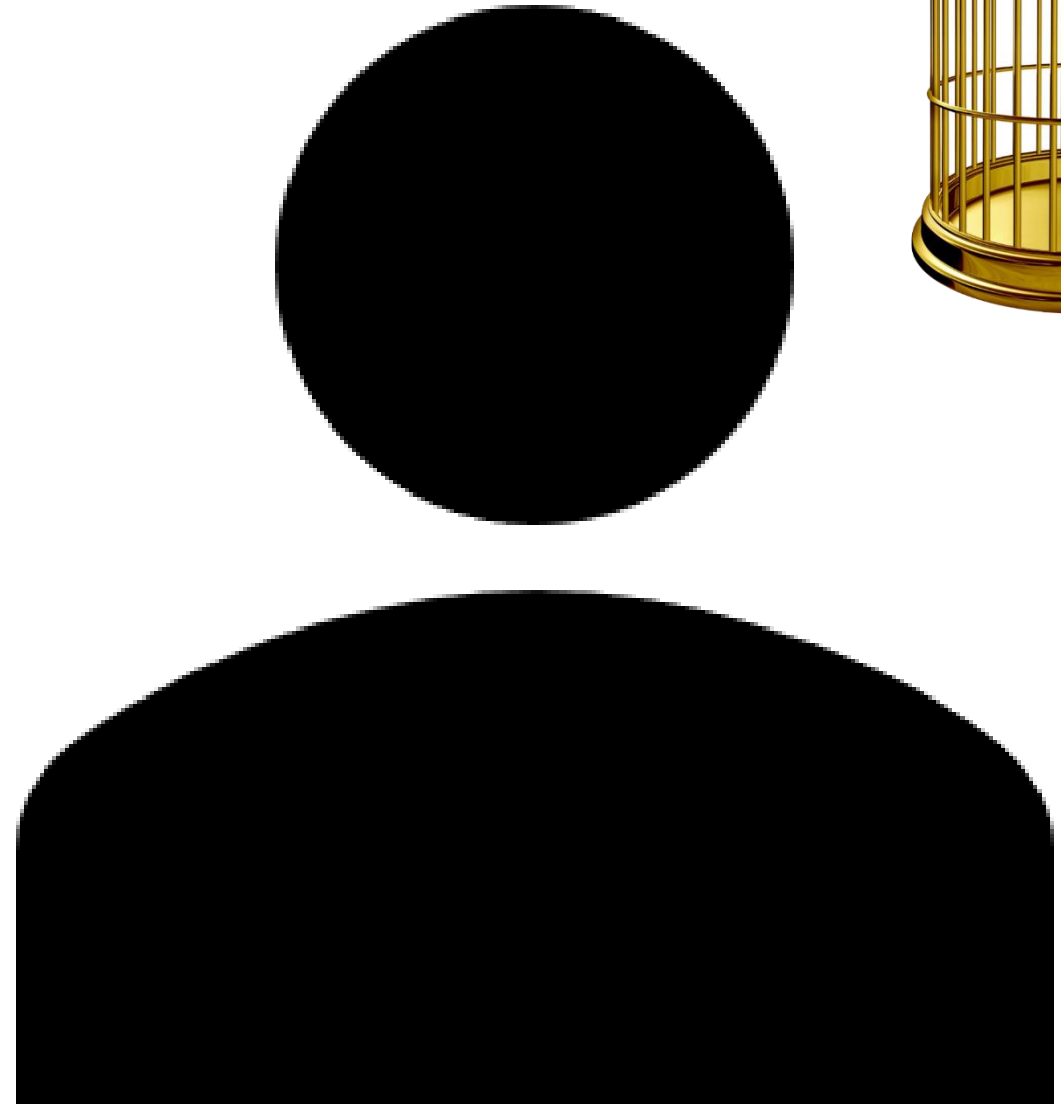
**People *love* it.**

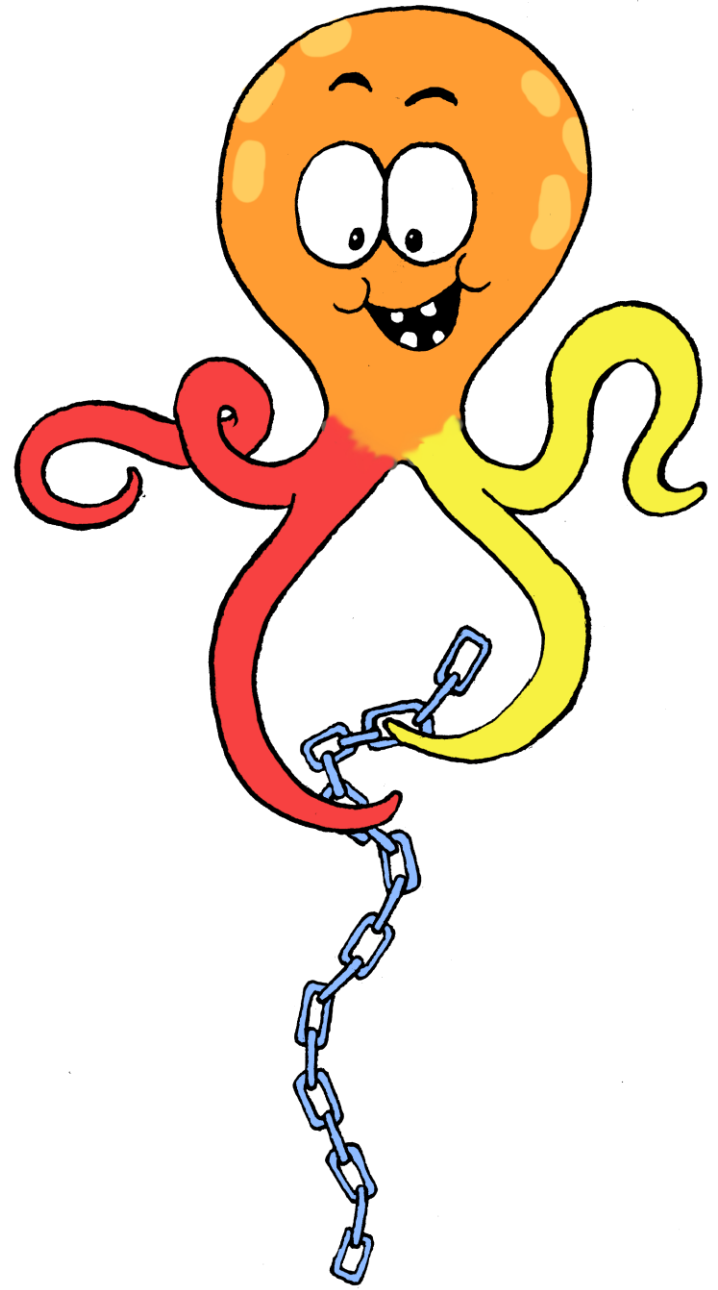


# Be Wary of Top “Online” Experts



**His Book**







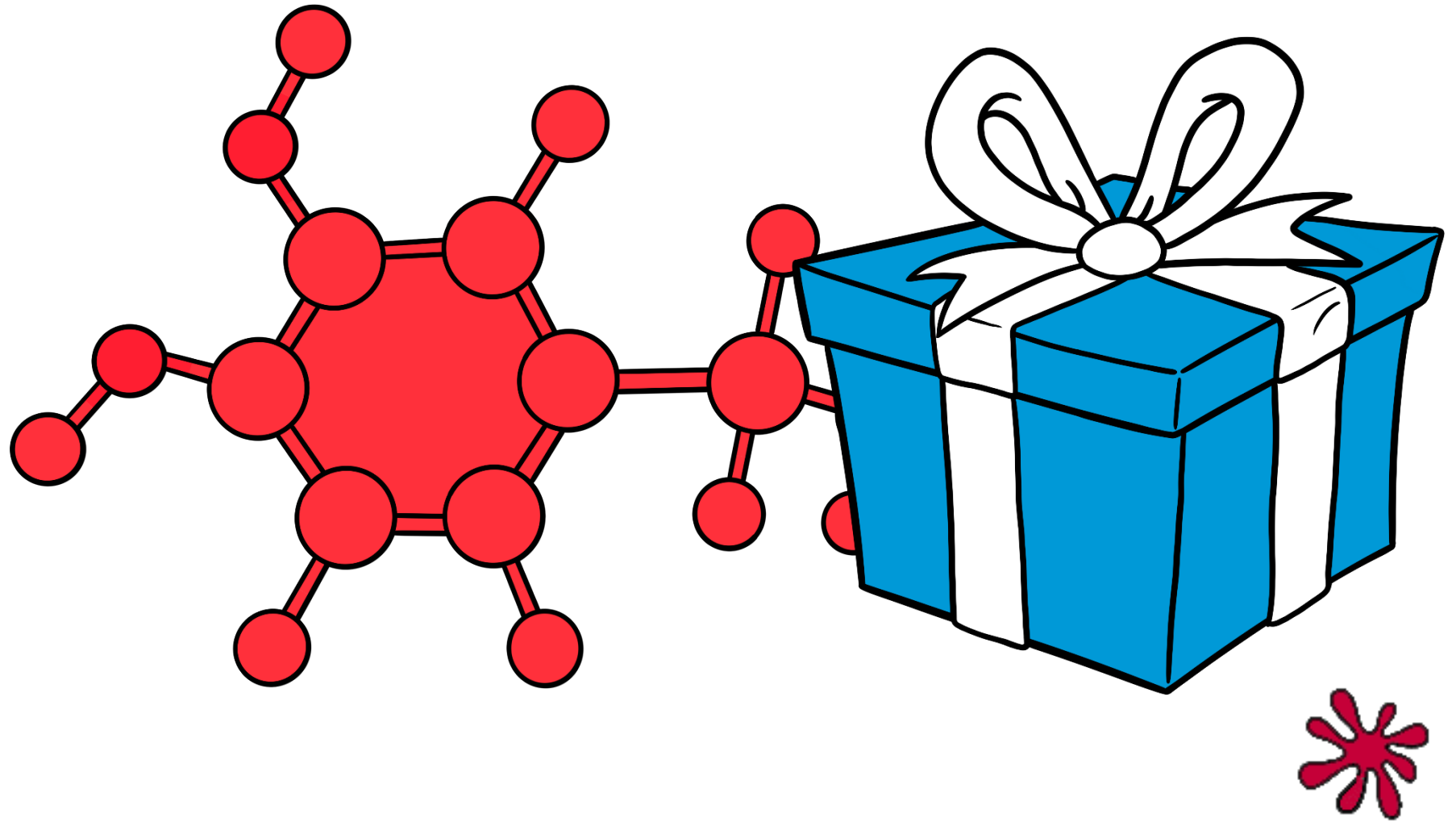
# Elements of Making Great Videos

## whether Seated at a Desk or Standing

(Based largely on Richard Mayer's Multimedia Theory)

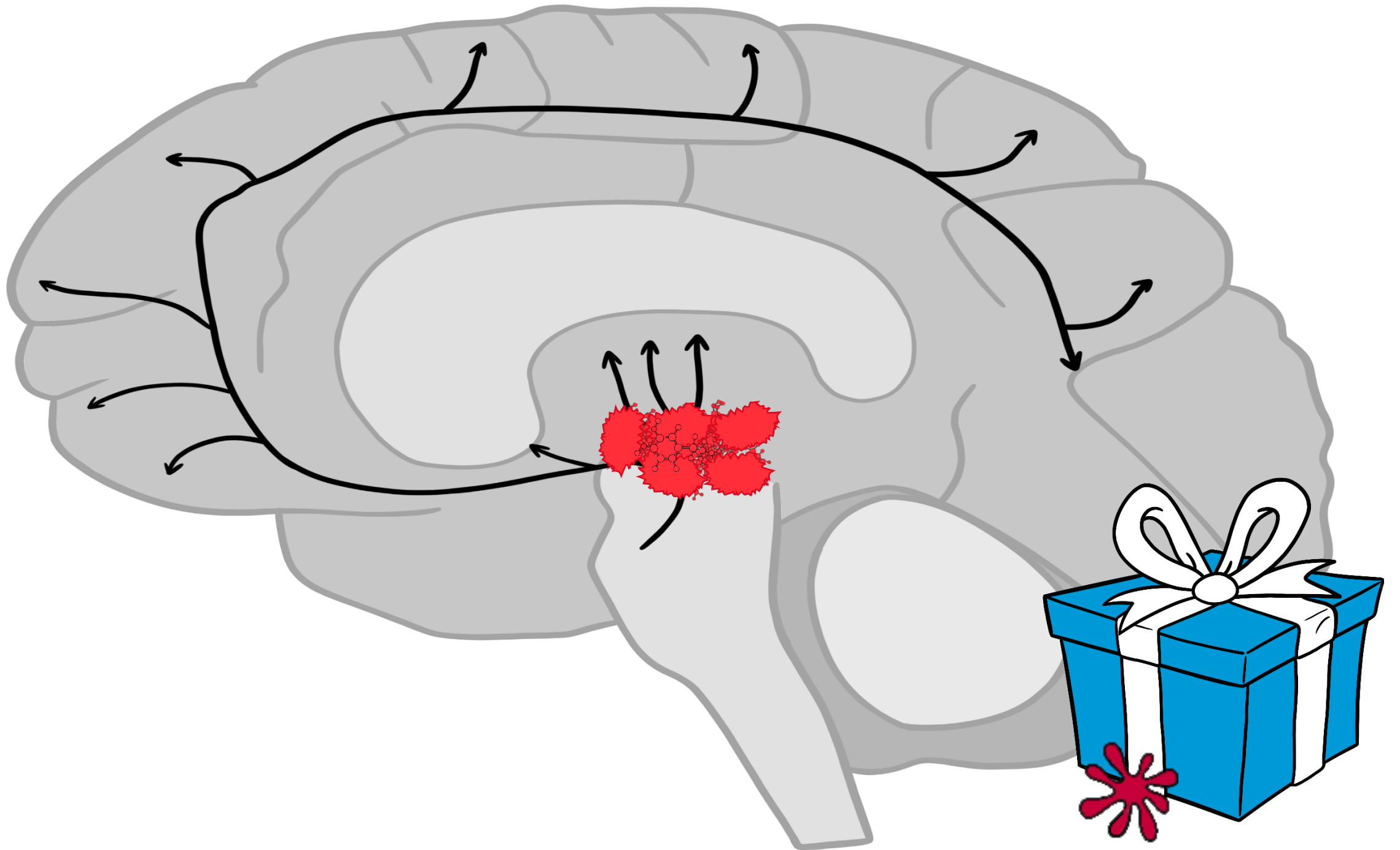
- Words and pictures are better than words alone
- Introduce complex material gradually; highlight important information
- Get rid of extraneous onscreen material
- Lesson contains prompts to engage in summarizing or explaining the material
- Speak clearly and enthusiastically
- On-screen agents should display humanlike gestures and movements
- Instructor shifts eye gaze between audience and board
- Instructor draws graphics on the board while lecturing

# What Mayer Misses



Dopamine—the “feel good molecule”





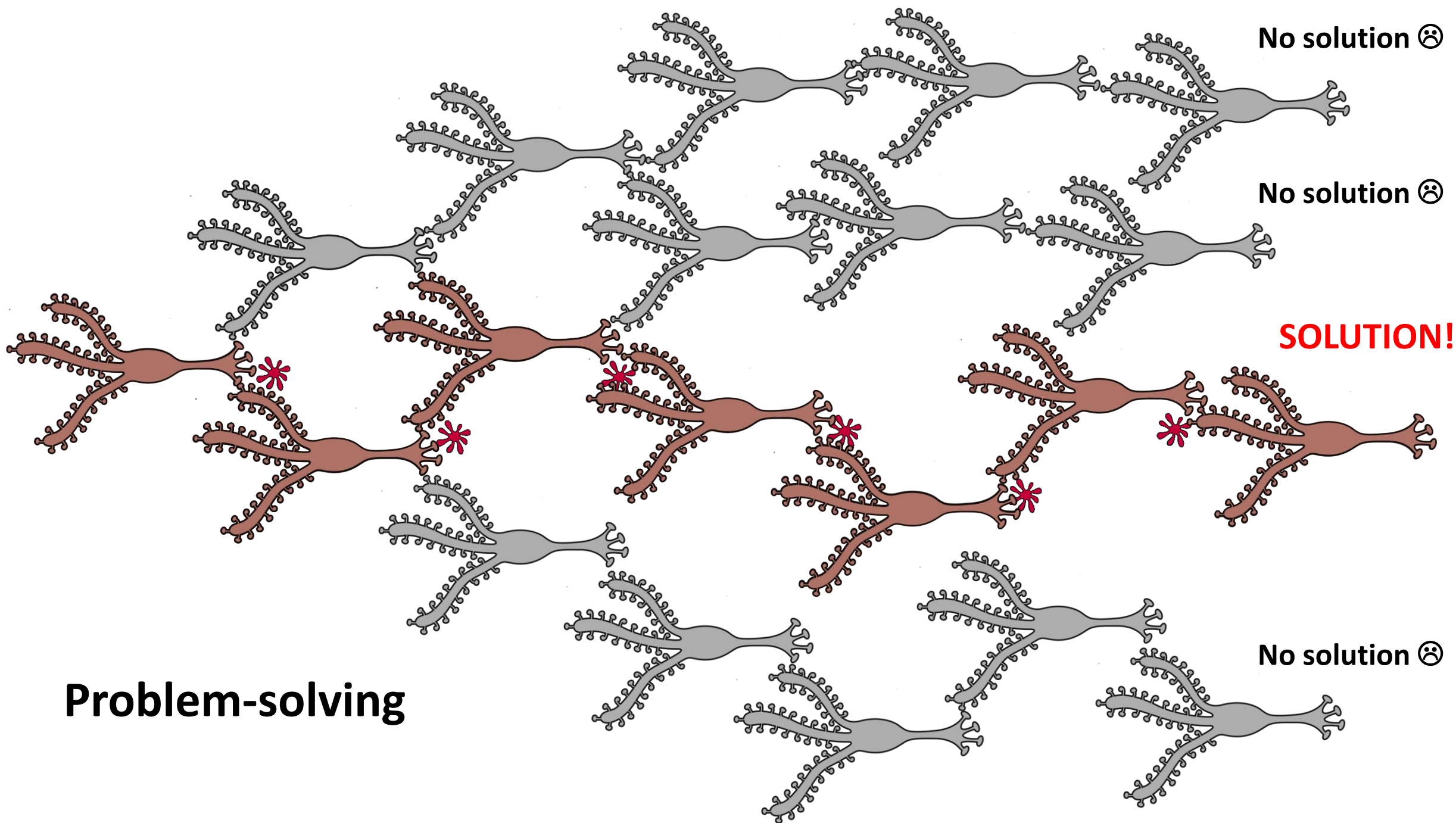
# \* Two “flavors” of dopamine

- **Tonic:** Helps with motivation.  
Always there, more or less.
- **Phasic:** Unexpected rewards—  
Prediction errors. Helps with learning.





Mice with damaged dopamine systems *can't learn anything new.*



No solution ☹️

No solution ☹️

**SOLUTION!**

No solution ☹️

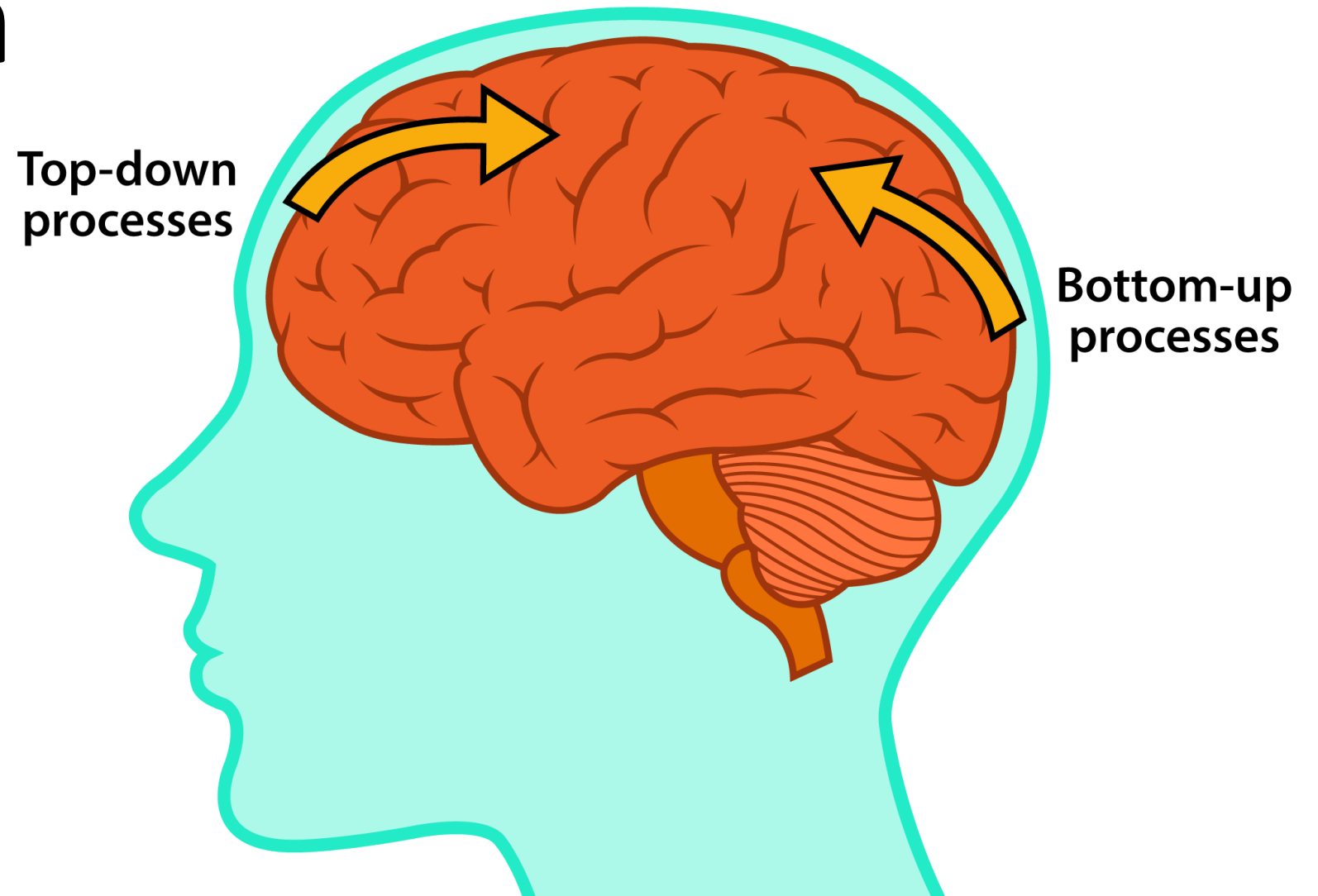
**Problem-solving**

**CURIOSITY IS KING**

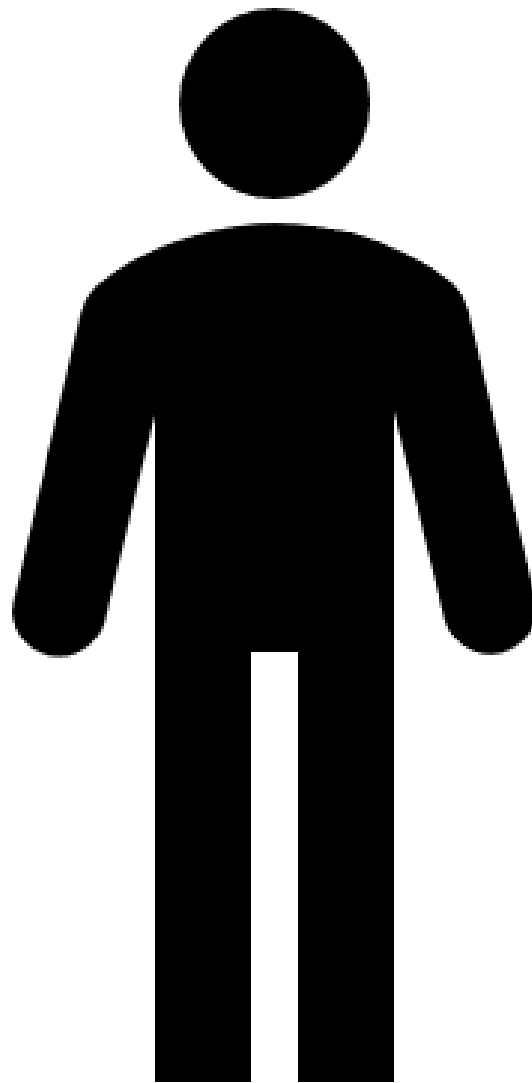
Lead with a *hook*

**MOTION IS THE MONARCH**

# Attention

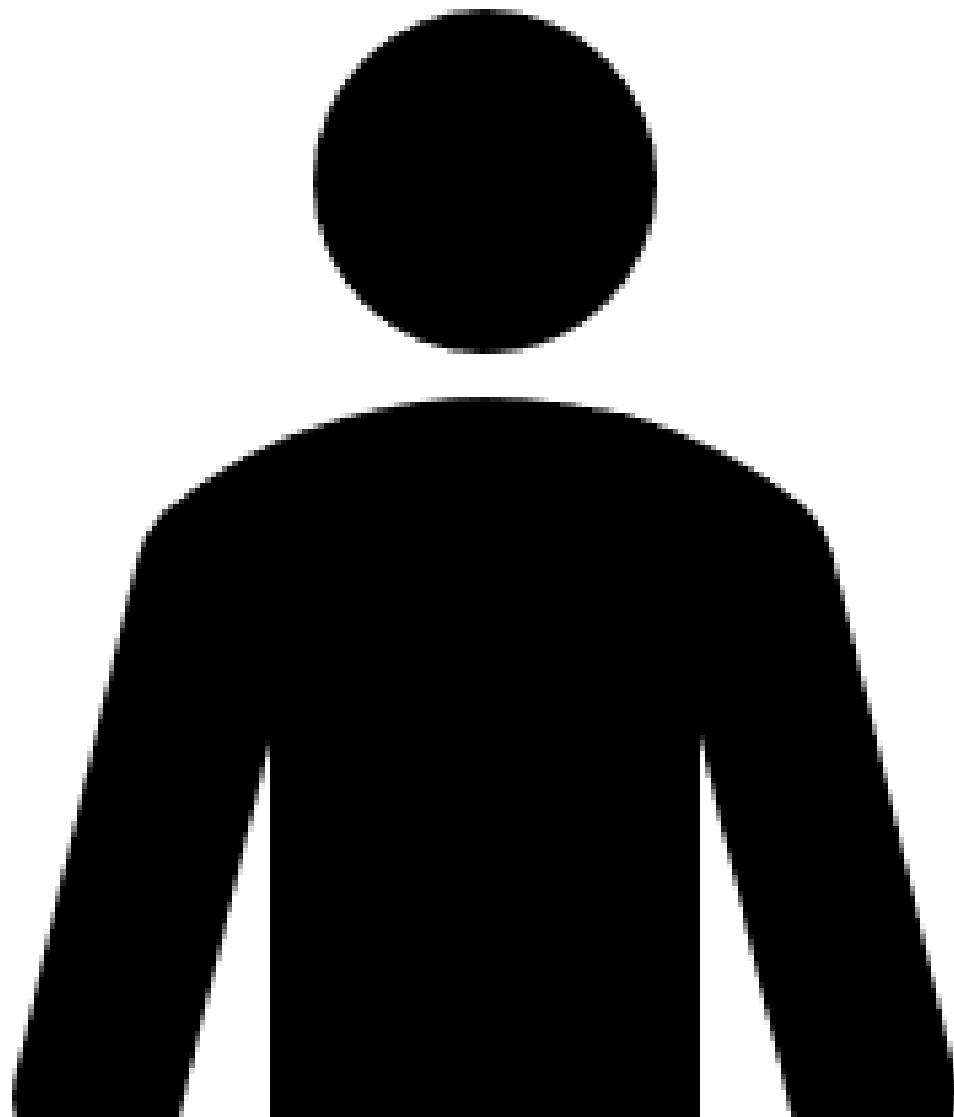


# The value of looming motion





# The value of looming motion



# Predictability principle

- Prolonged *static visuals* discourage sustained attention.
- *Visual change* attracts bottom up attention.

**Everything doesn't need  
motion!**

Remember, this is an art, not an  
algorithm!

# Build in interaction with the medium

- **Point**
- **Duck**
- **Grab**
- **Gasp**
- **Lean**
- **Push**

# **Be careful of video editing**

It can *make* you

or *break* you

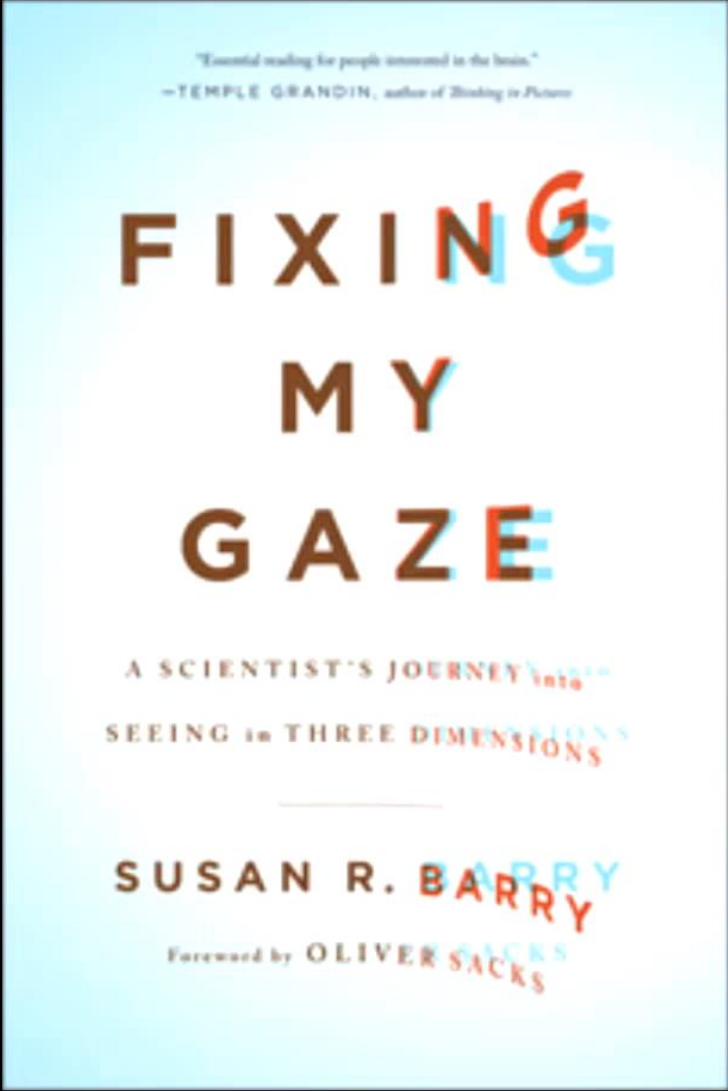
# Humor (Principle)

- **Old:**

Humor is a “seductive detail” that distracts from learning.

- **New:**

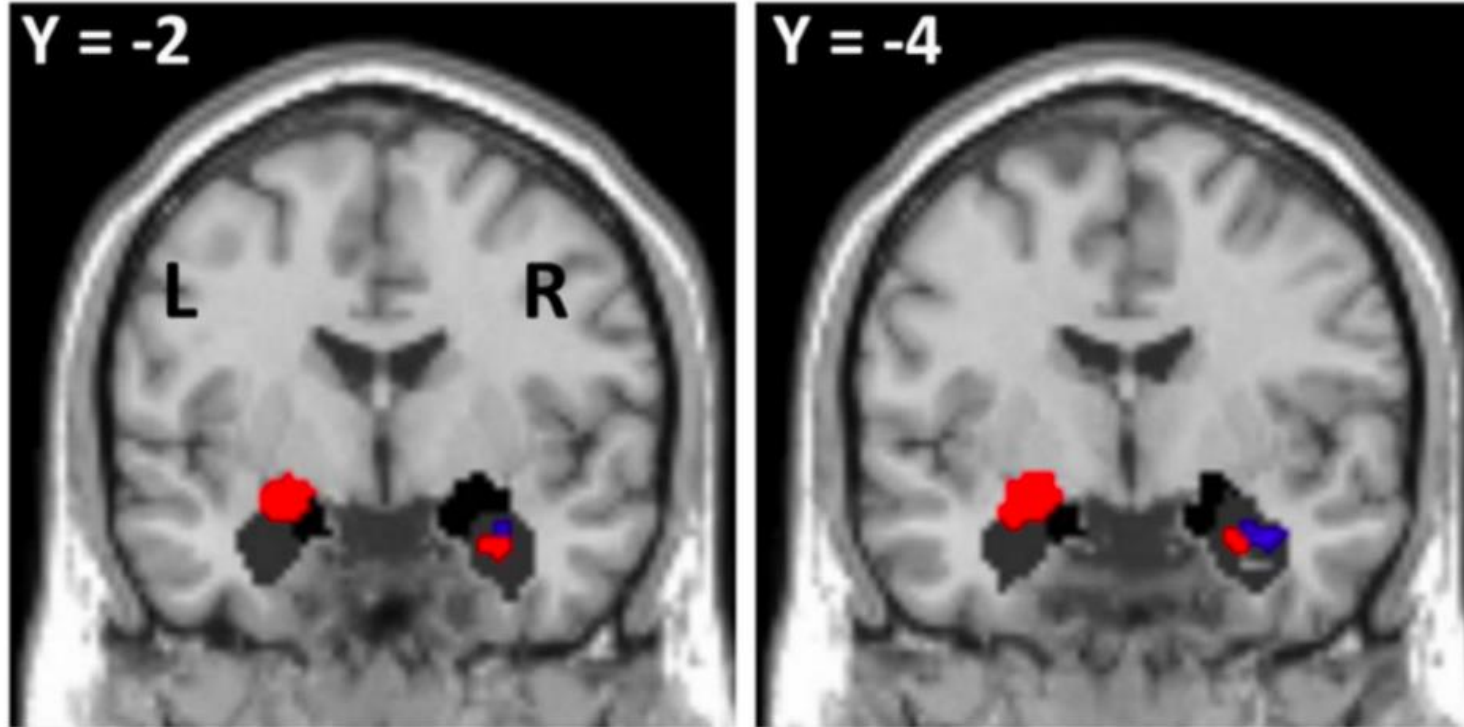
- People may not learn better with humor, but people will preferentially select multimedia learning that includes humor.
- Humor gives hippocampal and diffuse mode breaks.



# The Importance of Voice

“The Science Behind Hating Someone for Their Voice”

<https://www.ricemedia.co/the-science-behind-hating-someone-for-their-voice/>

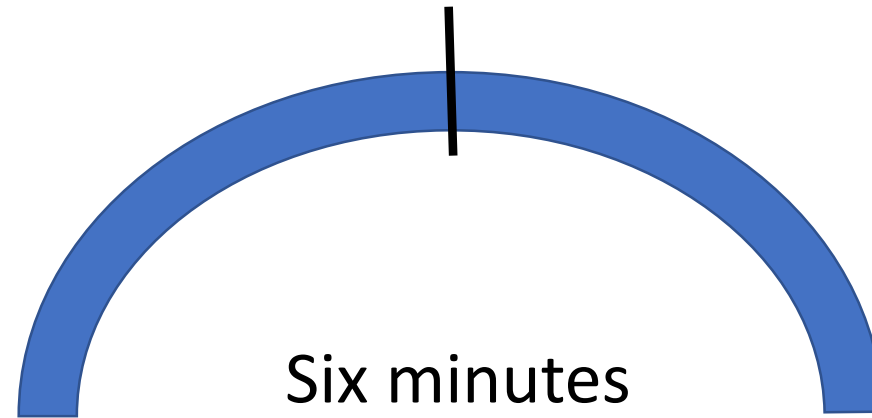


2400 to 5500 Hz = Distress signal

Responses in the amygdala (emotion processing center) that correlate with acoustic features and rating of unpleasantness.



# About six minute length



Lagerstrom, L, et al. "The myth of the six minute rule: student engagement with online videos." *In Proceedings of the American Society for Engineering Education*, 14-17, 2015.







Blue  
Blue Yeti USB Microphone - Blackout Edition

★★★★☆ 6,332 customer reviews | 1000+ answered questions

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- **Low Return Rate:** 27% fewer returns than similar products
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style: USB Microphone

- Assassin's Creed Origins Bundle
- Ghost Recon PC Bundle
- USB Microphone**
- w/ Pop Filter
- w/ Pop Filter and Headphones

Color: Blackout



- Tri-capsule array - 3 condenser capsules can record almost any situation;Power Required/Consumption: 5V 150mA
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Logitech USB Headset H540 for PC Calls and Music - Black

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★★★★☆ (329)

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- **Stereo Mode.** Left and right channels, ideal for realistic, general sound
- **Cardioid Mode.** Sound sources that are directly in front of the microphone.
- **Omnidirectional Mode.** Picks up equally from all directions.
- **Bidirectional Mode.** Front and the rear of the microphone. (Instruments, conversation.)

• Headset

# To teleprompter or not to teleprompter?

- Larger (24" on the diagonal) helps prevent squinting and flubs.
- High production value  $\neq$  learner interest



# Video editing script

## Shooting script

### Shoot 2-3

**Terry (HB):** Why do you procrastinate? When you even just *think* about something you don't want to do, **(point left)** it fires up a part of your brain called the *insular cortex*. That's a pain center of the brain! But the insular cortex happily settles down once you get to work on the task you were avoiding.

### Shoot 2-4

**Greg (HB):** So, one of the best tips to becoming a great learner is to just get going. Don't put your work off.

You're thinking, "But how can I settle down and just get working?"

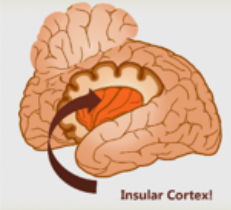
**(holds up tomato)** The solution.....yes, it's a tomato!

### Shoot 2-5

**Barb (HB):** In the 1980s, Italian Francesco Cirillo devised the Pomodoro Technique to help procrastinators. Pomodoro means "tomato" in Italian. Cirillo developed a tomato-shaped timer, like this one. **(holds up tomato)** Cirillo's technique is very simple—all it needs is a timer. A tomato-shaped timer like Cirillo's is really nice, but any timer will do. I often use a digital timer that I've downloaded to my computer. There are also Pomodoro apps that people like to use—the "Forest" app is especially popular.

**Terry (HB):** Why do you procrastinate? When you even just *think* about something you don't want to do it fires up a part of your brain called the *insular cortex*. That's a pain center of the brain! But the insular cortex happily settles down once you get to work on the task you were avoiding.

Do a screen capture of the Powerpoint animation in the assets where the "cap" opens to reveal the insular cortex. (Maybe take out the background on the Powerpoint to make it transparent, if you can.)



**Greg (HB):** So, one of the best tips to becoming a great learner is to just get going. Don't put your work off.

Greg's centered on the videos.

You're thinking, "But how can I settle down and just get working?"

Maybe jump him slightly closer

The solution.....yes, it's a tomato!

And again slightly closer—he holds up the tomato.

**Barb (HB):** In the 1980s, Italian Francesco Cirillo devised the Pomodoro Technique to help procrastinators. Pomodoro means "tomato" in Italian. Cirillo developed a tomato-shaped timer, like this one. Cirillo's technique is very simple—all it needs is a timer. A tomato-shaped timer like Cirillo's is really nice, but any timer will do. I often use a digital timer that I've downloaded to my computer. There are also Pomodoro apps that

Greg disappears. I appear on one side. When I say "Pomodoro Technique," the Pomodoro timer in the assets appears beside me.

Show the Laptop timer image that I put into the assets

# “Half script”

- Just have main bullet points
- Like this
- And this
- And this

# Differences

## In-Class

- Instructor controls presentation
- Last minute prep is OK

## Massive Online

- *Team* develops presentation
- Extensive collaborative preparations. You can't let your team down.



# Fake it 'til you make it!

- How you look is not the same as how you feel.
- If you are nervous, anxious or in pain—viewers often just don't know!
- Don't frown.



## **Conventional teaching:**

- Start with a formative assessment
- Tell them what you're going to tell them

## **Great teaching:**

- Start with a hook

# Video-taping tips

- Watch speaking speed (~150 to 200 words/minute)
- Avoid high pitched tones
- Enunciate clearly
- Start with a few later videos, so the first video isn't "deer in the headlights"
- Don't be afraid to look stupid
- Everyone is hypercritical of themselves

# For women

- Lower the pitch of the voice—too high is squeaky.
- Stand with hips a bit diagonally to the camera to look more svelt.
- Don't wear pearls or things that can click against a microphone. Nothing shiny.
- Wear a skin-tone bra.
- More generally--no stripes, moire, no green (if green screen)

What to do with the hands?



# Show credits and research

## Credits:

- Special thanks to Arshad Ahmad, Zafar Syed, and Liam Stockdale of McMaster University
- Editing and animation: Chris Lombardo
- Camera, sound, rough editing and script consultation: Phil Oakley
- Script and production: Barb Oakley
- Excavator and focused and diffuse flashlight by Maya Hartmeier, [maya.hartmeier@gmail.com](mailto:maya.hartmeier@gmail.com)
- Tye dye: <https://www.flickr.com/photos/surfergirl30/6085004536>
- Dance party: <http://giphy.com/gifs/dance-party-slumdog-millionaire-yoJC2I2uAdwUQa4OxW>

## References:

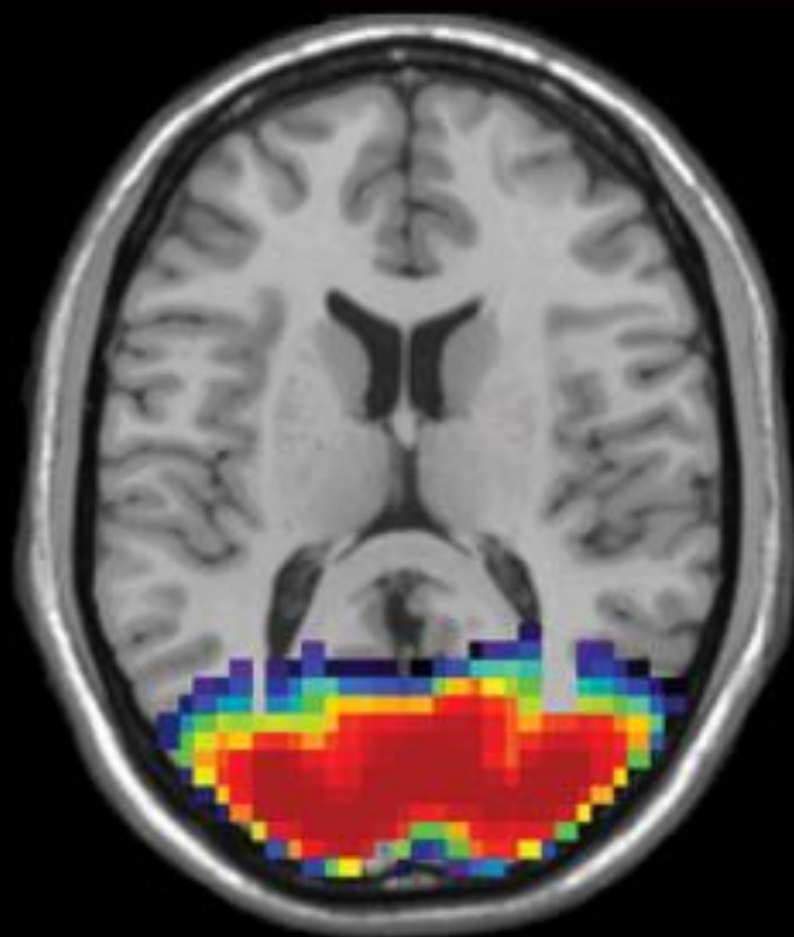
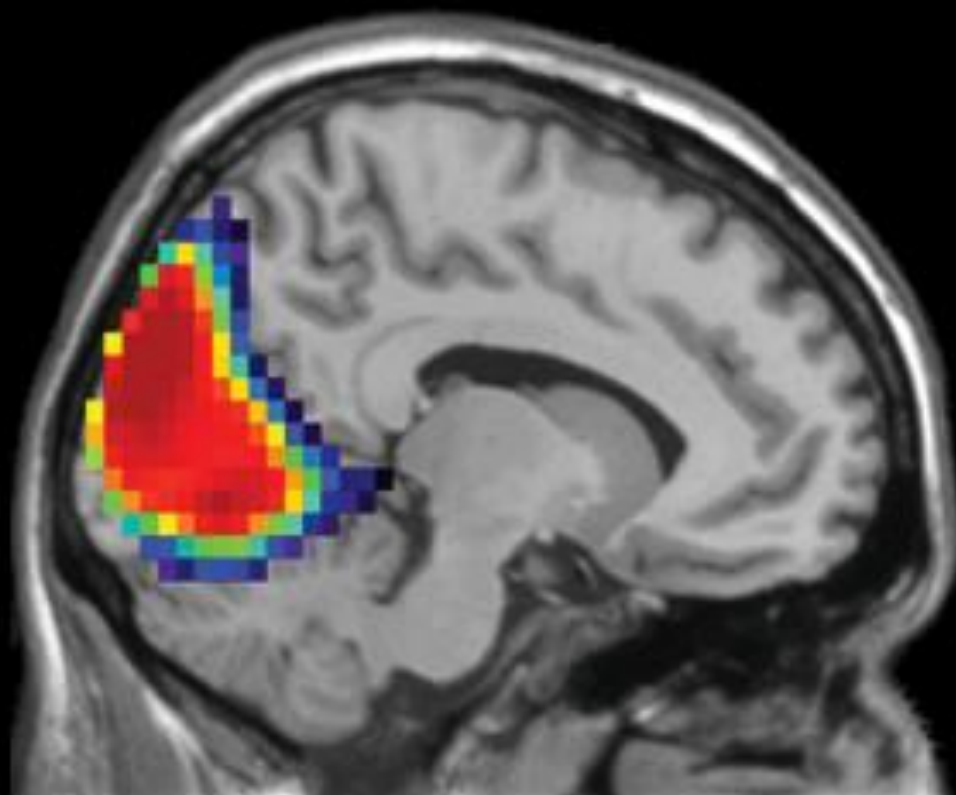
- Di, X, and BB Biswal. "Modulatory interactions between the default mode network and task positive networks in resting-state." *PeerJ* 2 (2014): e367.
- Fox, MD, et al. "The human brain is intrinsically organized into dynamic,

# The importance of good visuals

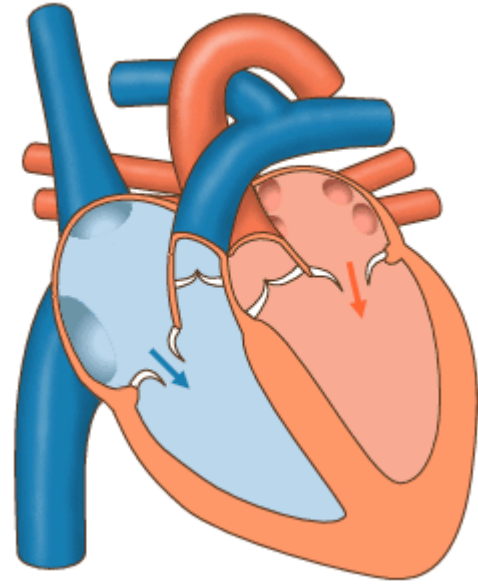
Kevin Mendez



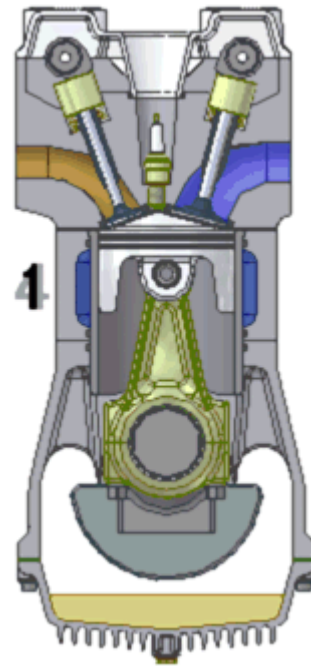
# Visual







- Try to get moving images where possible. (eg Videoblocks \$149/year; or Wikipedia)
- High quality is not necessary (eg Getty images)





**Take video/pictures of yourself,  
family, friends, students  
(remember to get releases)**





### Wacom Intuos Pro digital graphic drawing tablet for Mac or PC, Medium, (PTH660) NEW MODEL

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# Sources of Imagery and Music

- Free sources (but beware “royalty free” sources)
- Wikipedia
- Pixabay (imagery—some of it is free)
- Monthly subscriptions
  - Storyblocks (videos and music)
  - Pond 5 (videos and music)
  - <http://www.epidemicsound.com> (music)
  - [www.musicbed.com](http://www.musicbed.com) (music)



**Take video/pictures of yourself,  
family, friends, students  
(remember to get releases)**



# Editing quiz: Integrity and course policy quiz (open Jan 4-9) ?

Questions: 6 | This quiz is closed

Maximum grade

10.00

Save

Repaginate

Select multiple items

Total of points: 6.00



Shuffle ?

Page 1


Add ▾

- |  |   |   |  |  |      |
|--|---|---|--|--|------|
|  | 1 | <b>Integrity Policy</b> * My answers to homework, quizzes and exams will be my own work (except for assignments that explicitly permi...      |  |  | 1.00 |
|  | 2 | <b>No other dropping of quiz scores</b> I understand that the lowest "in class" quiz score is dropped. I understand that this "lowest dr...   |  |  | 1.00 |
|  | 3 | <b>MOOC Learning How to Learn</b> I understand that I must click on the link I receive in an email around or before the beginning of t...     |  |  | 1.00 |
|  | 4 | <b>No unfair hints</b> I understand that I can ask questions related to the quiz or the final examination during the quiz or examination i... |  |  | 1.00 |
|  | 5 | <b>Moodle quiz scores replaced by "in class" quiz scores</b> I understand that, at the end of the semester, if my if my "in class" quiz g...  |  |  | 1.00 |
|  | 6 | <b>Calculator use</b> I understand that quiz questions that ask for a numerical answer must be answered by an actual number, such as ...      |  |  | 1.00 |

Add ▾

## Chapter 2: Probability

 Forum--please post your questions related to Chapter 2 here

 2A Review of Set Theory (35 minutes); Read Ch 2-1

 2A Review of Set Theory Powerpoint

 How to calculate (be sure you can do this before taking quiz!)

 Homework 2A assignment

 Quiz 2A Review of Set Theory (open Sep 3-13)

 2B1 Random Processes & the Rules of Probability (33 mins); Read Ch 2-2, 2-3, 2-8

 2B Random Processes Powerpoint

 Homework 2B Assignment


 Quiz 2B1: Random Processes & the Rules of Probability (open Sep 3-13)

 A brief introduction to the history of probability--Be sure you figure out how the "7/8ths" probability for winning was calculated, in case you are asked a variant of that scenario on the following quiz!

 Discussion of Historical Posting Due by Sep 13

 Quiz 2B2: History of probability and basic calculations (open Sep 3-13)

 2C Conditional Probability and Bayes Theorem (44 mins); Read Chs 2-4, 2-5, 2-7 (new version for T)

 2C Conditional Probability, Bayes Theorem Powerpoint


 Homework 2C Assignment

 Quiz 2C: Conditional Probability (open Sep 14-20)

 2D A Few Final Problems (27 mins); Read Ch 2-6, more review of 2-4, 2-5 and 2-7

 2D a few final problems Powerpoint

 Homework 2D Assignment

 Quiz 2D Wrap up (open Sep 14-20)

# Fill notes in by hand

## Definition

- A set is a collection of objects called elements
- Examples:
  - $A = \{ \text{ostrich, gorilla, boat} \}$
  - $B = \{ 1, 2, 3 \}$

Note that a set may contain a finite or an infinite number of elements.



## Chapter 2: Probability

 Forum--please post your questions related to Chapter 2 here

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 2A Review of Set Theory Powerpoint

 How to calculate (be sure you can do this before taking quiz!)

 Homework 2A assignment

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 2B Random Processes Powerpoint

 Homework 2B Assignment


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 Homework 2C Assignment

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 2D A Few Final Problems (27 mins); Read Ch 2-6, more review of 2-4, 2-5 and 2-7

 2D a few final problems Powerpoint

 Homework 2D Assignment

 Quiz 2D Wrap up (open Sep 14-20)

The down side

The fan letters

We are at the ground floor of  
a learning revolution!

*What are you waiting for?*

What is the most important information you will use and apply from this webinar?