

Sci Comm skills - DMPP

DR PHIL DOOLEY
GALACTIC COMMANDER,
PHIL UP ON SCIENCE

Handouts:



The Plan

TODAY

9-10.30 General Principles, Media

<Morning tea - 30 minute break>

11.00 – 1 PM More Media, Presentation skills, wrap up

Dr Phil Dooley

Science in the Pub, Dramatis Scientifica Theatre Collaboration

Sustainable Stand Up, Rebus Interactive Theatre, Sydney Science Festival, Adelaide & Sydney Fringe, Brighton Science Festival, Oxford Science Festival.

Freelance Writing & Video Making

Cosmos, Nature, New Scientist, Physics Today, Academy of Science, ARC Centres of Excellence

- *Best Australian Science Writing 2018, 2019, 2020*

Jobs

ANU Physics - ANU Media - Joint European Torus (Eurofusion) - Uni of Syd Physics

A bunch of bad bands that rocked lounge rooms around Canberra

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Why are you here?

How do you feel about communication?

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What's the desired outcome?

Actions, attitudes, identity
... education?

(... this helps with evaluation)



Barriers

Impatient/short attention span

- Unless in a focused mood

Competition from other distractions

Not my problem

- Give me a solution
- (science is good news!)

Bubbles/word of mouth

- Social media echo chamber

Confirmation bias

Familiarity - trust in friends' opinions, or (worse!) celebrities'

(Your own resistance – are you qualified enough?)

The Deficit Model

Education is achieved by filling a *knowledge gap* with facts.

Compare with *Constructivism*

(Derek Muller, Veritasium)



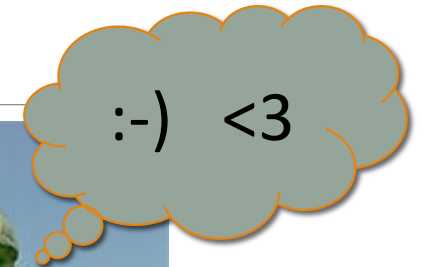
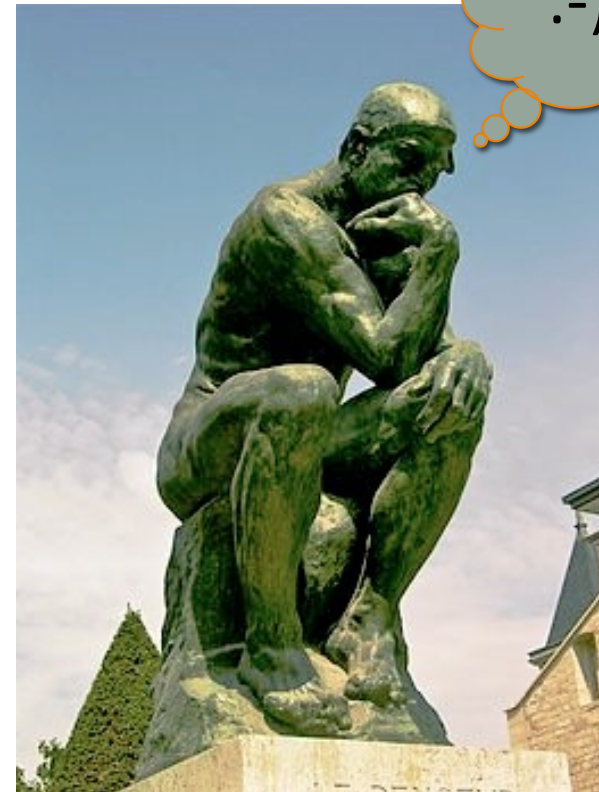
medicine.ukzn.ac.za

Feeling is the new thinking

Don't educate

Appeal to a different part of the brain

Connect with people who don't want to be told stuff right now.



How to connect with a human

Stories about characters

Emotional journeys – status changes

Right and wrong

High stakes

Beauty and horror



IT'S NOT GOOD SCIENCE

Science & pop culture/news are opposite

NEWS/POPULAR CULTURE

Is happening now
Is a landmark, surprising, unusual
Colourful, human element (trust)
Personal stories, anecdotes
Is black and white, judgmental
Can be fooled by counterexample
Uses simple statements (soundbites)

RESEARCH

Slow gradual process
Often null results
Removes all subjective details
Focuses on final result
Doesn't moralise, is not absolute
Triangulates data, triple checks
Builds knowledge in layers of certainty

Science & pop culture/news are opposite

NEWS/POPULAR CULTURE

Tangible results

Applications that affect me

Needs people for interviews

Daily timeframe and follow-ups

For general audience

RESEARCH

Often abstract or theoretical

Process oriented

Academics often teach, travel

Timescale - years

For specialist audience

It's not completely impossible – but a change of emphasis is needed

Your sci comm should:

Get to the point

Connect with audience's values

Engage them with the arts

- Narrative
- Images
- Humour

Be emotional

- Keep emotion separate from the science



COMMUNICATION IS NOT SCIENCE

Know your audience



What do they already know?

- Don't be afraid to recap

Motivation

Beliefs & attitudes

What do they feel about you?

What do you feel about them?

Trust

COMPETENCE Qualifications ON YOUR SIDE Rapport, connection, familiarity
Experience Shared experience
Similar values (Listening)



Values you share with your audience

Why would they care about your science?

Why would they trust you?

- Are you competent?
- Are you on their side?

To build rapport emphasise shared values, humour, familiarity and emotional connection.

Entertain, then inform

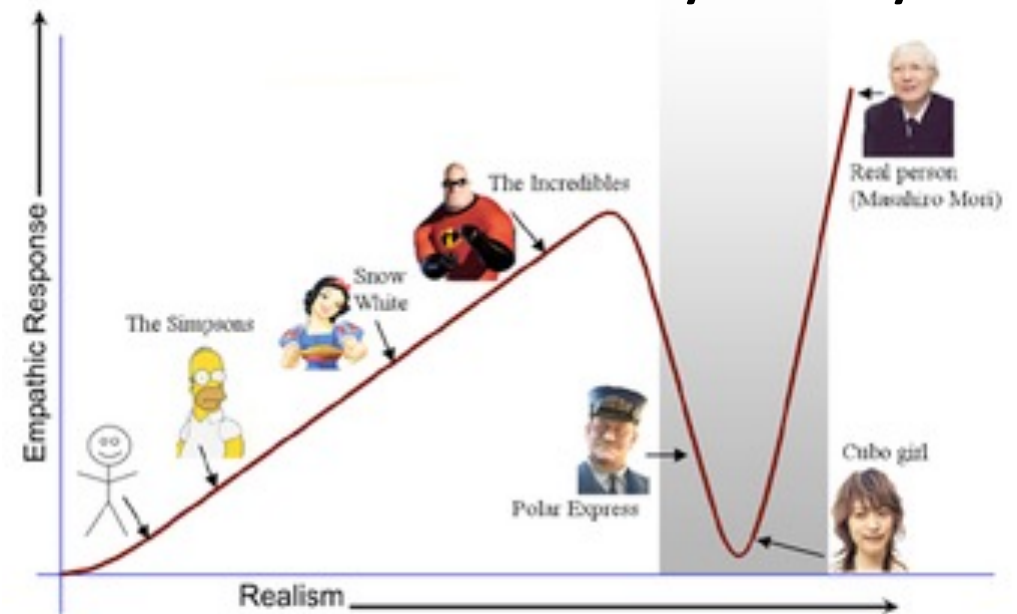
What will happen if
you do it in the
opposite order?



Be Human



Avoid the uncanny valley



<break>

Any insights so far?



Presentations Structure

DR PHIL DOOLEY - GALACTIC COMMANDER, PHIL UP ON SCIENCE

Handouts: philuponscience.com.au/captivating-presentations/

Presentation structure

- 1) Connect with your audience
- 2) Lead: Get to the point and grab their attention
- 3) Nutgraph: Make them care
- 4) Tell stories
- [5) Call to action]

1) Getting off to a good start

UNIVERSALS

Inclusive concepts

Something nice

Share yourself

A joke even?

- Don't punch down

Keep it short!



2) Telephone test your lead

Ring your best friend and say:
“Guess what? ...”

Just say it.



Getting to the point

“The existence of gravitational waves has been a matter for some debate, since they were first proposed in 1916.”

“For the first time, scientists have observed ripples in the fabric of spacetime called gravitational waves, arriving at the earth from a cataclysmic event in the distant universe. This confirms a major prediction of Albert Einstein’s 1915 general theory of relativity and opens an unprecedented new window onto the cosmos.” - Caltech

Connection to audience

“Susan Scott was out shopping in the boxing day sales when she received a text message saying that the nature of space and time had changed, but she couldn’t tell anyone.”

- April Dudgeon, Canberra Times.

Clap snap boogie

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Write your telephone lead – 5 mins

Choose a current or past research result

Write a lead

Then share in pairs.

Check for jargon. Does your partner know/understand all the words?

3) Why should they care?

What is the problem you are solving?

What's the bigger context ?

(Why do you care?)

This is where you connect to your audience's values

Journalism: the nut graph

The in-a-nutshell paragraph,
originated by Bloomberg.

Why should we care?

How many people die of this
disease?

How many \$\$ is the industry
worth?

How soon will resources run out?

How will it affect my life (fear and
greed)?



(News values)

News Values (journalism)

Impact

Proximity – geographical, relevance

Prominence/celebrity

Human Interest

Bizarreness

Conflict

Timeliness – will this story lose interest tomorrow.

Currency – already in the news

Tangible and specific

“The breakthrough is expected to make a significant contribution to a wide range of applications in many technological fields.”

“Because this technology costs less than \$10 apiece it can be used for the early diagnosis of lung disease and could save millions of lives in developing countries.”

Share in pairs

Find a new partner

Why does your research matter? Does your partner agree – or might they have a different reason?

Process is boring

The team measured the climate at the same latitude on four different continents and compared the results over 5 successive years.

They found the climate in central Africa has become 50 percent less stable in the last 5 years than a location at the same latitude in South America.

(4) Narrative

Have you ever watched a movie, read a book twice?

What is a story?

Which is a story?

When PhD student Mingkai Liu found a piece of wire in his washing basket, it triggered an idea that led to him developing a new material that could put a twist into light.

A new approach to radiation therapy is harnessing nanoparticles to take cancer treatments right into the tumour.

Professor Ross Stephens is the pioneer of the technique, in which tiny spheres are injected into the bloodstream so as to accumulate in the cancer and deliver beta radiation.

The power of stories

A subtle way of highlighting what you want.

Susan Scott was out shopping in the boxing day sales when she received a text message saying that the nature of space and time had changed, but she couldn't tell anyone."

Narrative Structure

Hero's journey - Romantic Comedy

Ordinary person

- > gets drawn into larger quest
- > High stakes
- > Challenging, many failures
- > The character learns and grows
- > Prevails, and now

Is a hero!



Narrative Elements

Character goes through an emotional journey

- Bad things happen
- Plot twists
- Fall from grace (change of status)
- Learning moment

The Turning - Tim Winton;

God of Small Things - Arundhati Roy



What's your story?

The great quest (and what inspired it) ?

The challenge you have to overcome?

Emotional ups and downs?

Living happily ever after?

How do you feel about each part of the story?

Share how you feel

Humans connect with emotion:

What emotions does your work inspire in you?



What emotions does your research inspire in you?

Surprise

Triumph, pride

Optimism

Curiosity

Disappointment

Fear

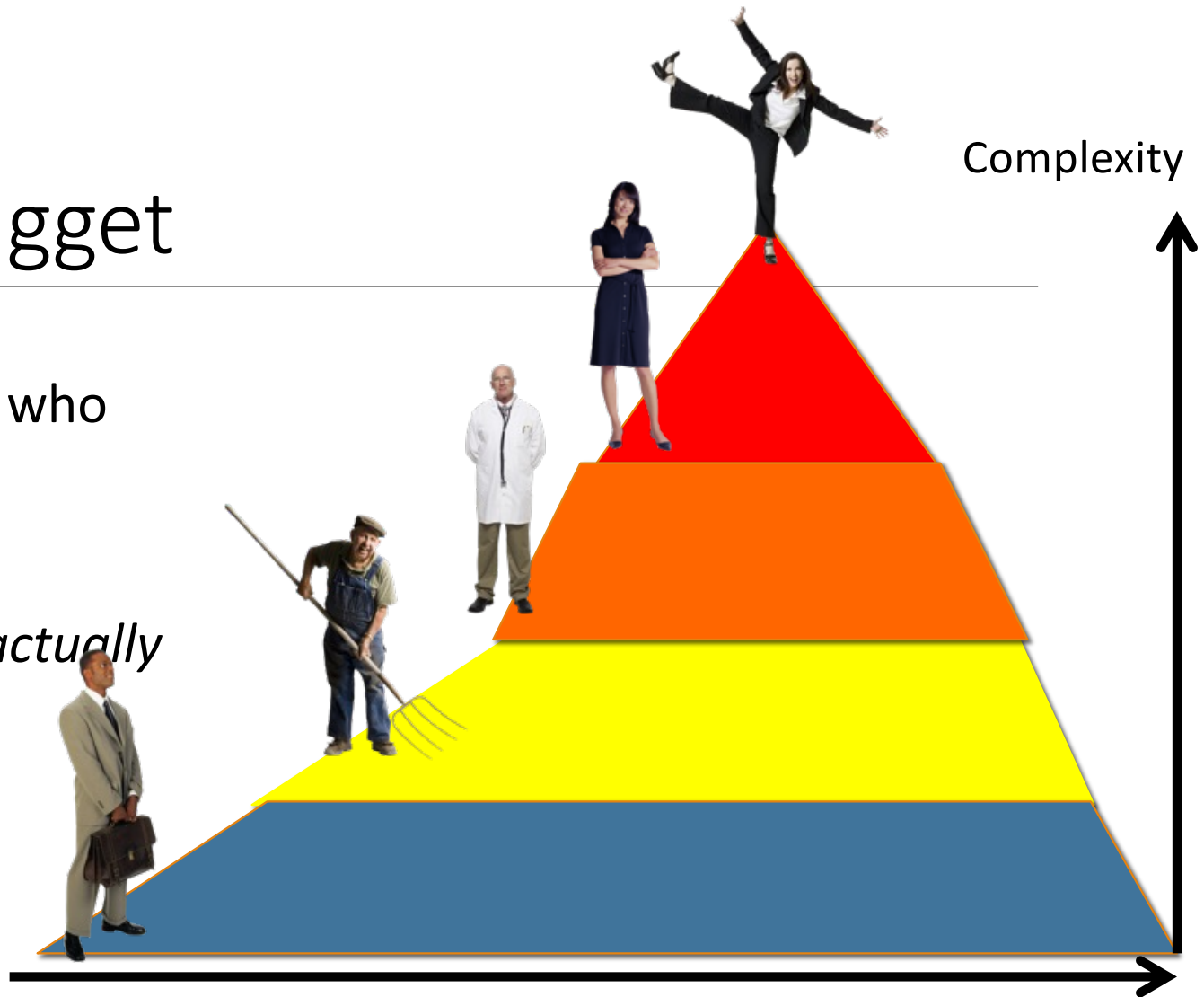
Combine these to get a story

(Separate your emotional reaction from the facts)

The science nugget

A reward for the expert, who knows the field.

What did the scientists *actually* do that was new?



5) Call to action

What's the outcome you want?

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Presentation structure

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Media

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A good time

The media is an entertainment industry.

If you are fun and engaging, the content is irrelevant*

If you are boring and waffly, the content is irrelevant.

Take control if you want (“Before we discuss that, here’s a great story...”)

(a controversial headline to get your attention)*

Catch a wave

Add a new angle to an existing story

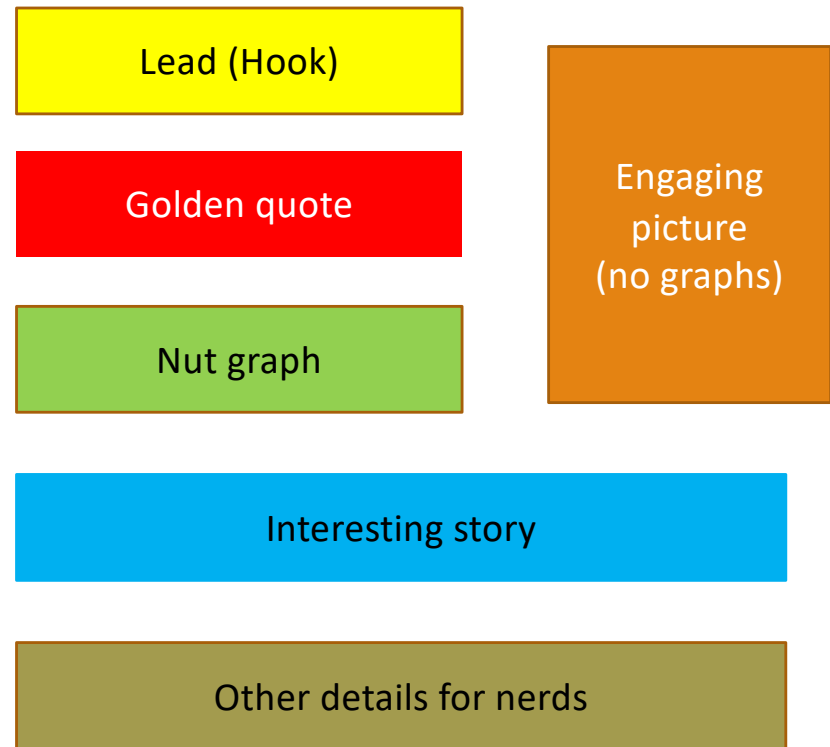
- Easier than creating a buzz by yourself



Media release

Is bait to attract an outlet to cover your story.

(can be reproduced by bots on a content website)



Headline

You need a strong action word in the first 7 words (Daily Telegraph)

Don't be too cute/abstract, the audience needs a tangible hook

Write out 7 versions of your headline before you choose.

Justify the headline in the first few paras

Lead (Hook)

Golden quote

Nut graph

Interesting story

Other details for nerds

Engaging picture
(no graphs)

Quotes & Interviews a chance to be human

Think broadly, about the wider context.

- Where did the work/field originate?
- Why is it important,
- What could it lead to?

Express your emotions: hope, fears, frustrations, excitement, delight...

- Speculate a little
- Tell a quirky story
- Have some fun

No facts in quotes. Facts are NOT opinions

Facts are not Quotes

...This exciting discovery shows that the team's courageous investment in an undervalued technology has been worth every cent.

“We have made the most accurate measurement of the fine-structure constant, which underpins many modern electronic devices,” Professor Eks said.

One thought, one sentence, one para

“Every word deleted is a triumph.”

- John Coomber, AAP training.

The 5 Ws are a waste of words

(what, where, when, who, why)

Facts are only important if changing them changes the story

At 5.30 PM on Saturday 27th of January, a white commodore station wagon travelling northbound on the Hume Highway just west of Yass left the road when the driver, a 37 year old Melbourne woman lost control of the vehicle.

In the accident the car was left upside down, and the driver was rendered unconscious. There were two other occupants of the vehicle, the woman's 5 year old son and 3 year old daughter.

By the time a passer-by stopped to assist, the 5 year old boy had opened the car window, and removed his unconscious sister from the rear seat.

Be on the side of the reader

Here is what it looks like, when a massive black hole devours a star

Faculty of Science - University of Copenhagen

NEW COMPUTER MODEL: Dr. Jane Lixin Dai, theoretical astrophysicist and assistant professor and Prof. Enrico Ramirez-Ruiz, both from the DARK Cosmology Center at the Niels Bohr Institute, University of Copenhagen, have recently provided the scientific community with a much-needed computer model. It is necessary for the investigation of Tidal Disruption Events - rare, but extremely forceful events taking place in the center of galaxies.

A Star is Torn

Astronomers have caught a supermassive black hole secretly devouring a star and spraying its entrails across the sky.

The grisly event took place under the cover of a thick dust cloud, but the team, led by Seppo Mattila from Tuorla Observatory in Finland, and Miguel Pérez Torres from the Instituto de Astrofísica de Andalucía in Spain, captured it with infrared and radio telescopes that could see through the dust.

Astronomer Stuart Ryder from the Australian Astronomical Observatory in New South Wales was part of the team watching through the Gemini North telescope in Hawaii as the decade-long drama unfolded.

“It’s a cool phenomenon, a star being torn apart as it gets sucked into a supermassive black hole,” Ryder says.

Such an interaction, known as a tidal disruption event, has never been seen in such detail before. The combination of infrared and radio telescopes revealed the struggle, with a jet of gas ejected initially at close to the speed of light.

“For the first time we have radio observations that confirm the presence of a jet – these stars go down fighting,” says Ryder.

“Not all of the star gets devoured – a star like this, of between two to seven times the mass of the sun, is a lot of gas to absorb – some gets shot out.”

Negative or hostile audience/interview



Research your audience, interviewer

Connect with them on common ground, human values.

- Answer questions with your emotional viewpoint

Don't preach or contradict => this entrenches views

Practise!

Say no if you want.

Use your uni's media team

Register as an expert

Give them warning of publications

Plan pictures, videos etc from the beginning

Consume

If you want to write – then read

If you want to speak – then listen

Start small

Community Radio

Writing: check out Bianca Nogrady's resources

<https://biancanogrady.com/2017/11/14/got-a-story-pitch-here-are-some-outlets-you-might-not-have-thought-of/>

Volunteer at a local science centre/museum or for the Uni

Practice Interview

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Presentations Design tips

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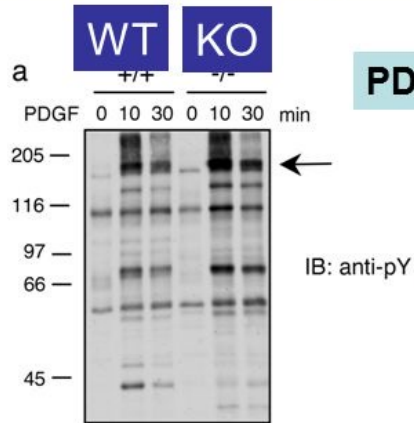


How many pieces of information per slide?

1

(Don't be afraid of dividing slides – tabs, headers etc)

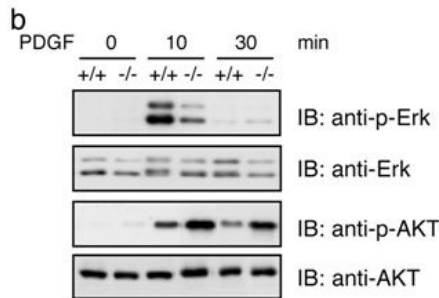
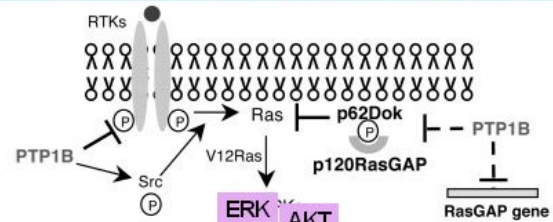
Is tyrosine receptor phosphorylation increased in PTP1B^{-/-} mice?



PDGF stimulation:

Fig. 1. Differential regulation of PDGF-signaling pathways by PTP1B

cellular tyrosine phosphorylation increased



Erk phosphorylation decreased in PTP1B knockout cells

AKT phosphorylation increased (more in PTP1B^{-/-} cells)

Thus, some proteins are (AKT), some aren't (ERK)

Conclude- PTP1B seems be selective

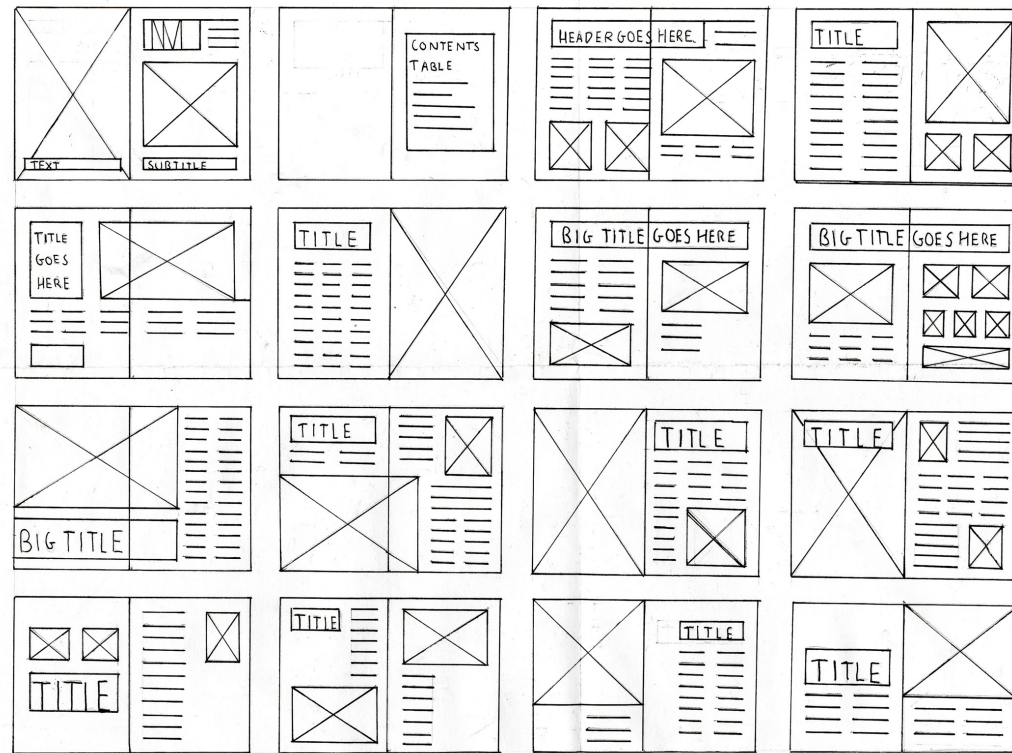
What percentage of a talk is remembered?

Design: Less is more

Fewer design elements and colours make elegance easier

And readable too

Design: Grids



patriciasdesignsite.wordpress.com

Design: Colours

Minimal colours

Web safe and readable

Choose colours from images





Images
shadow text

Using filled box,
50% transparency,
soft edges

Reading vs hearing

People remember:

- 10 percent of what they hear
- 20 percent of what they read
 - Less if both at once
- N percent of what they see and do

(Lester, 2006)

What is N?

Reading through slides

- ◆ Some people use slides as a reminder for everything they need to say
- ◆ Then they read through the slides point by point
- ◆ which drives the audience crazy
- ◆ because they have already read ahead
- ◆ and now they have to listen to this idiot droning on.
- ◆ Come on! Shut Up Already!

Accents and speech impediments

An exception:

If you are worried about your spoken English not being completely understood,

then you can write your text out for the first few slides so that people can get used to the rhythm of your speech.

Australian Accents?

Beware of rising tone?

Practice the definitive downward sentence conclusion.

“I am completely sure of our results”

Include

Thank yous and acknowledgements

Affiliations, groups, grants etc

Contact details

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Presentations Event tips

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Handouts: philuponscience.com.au/captivating-presentations/

Timing

Who likes it when a speaker goes over time?

Have markers

- with material to cut.



Vary it

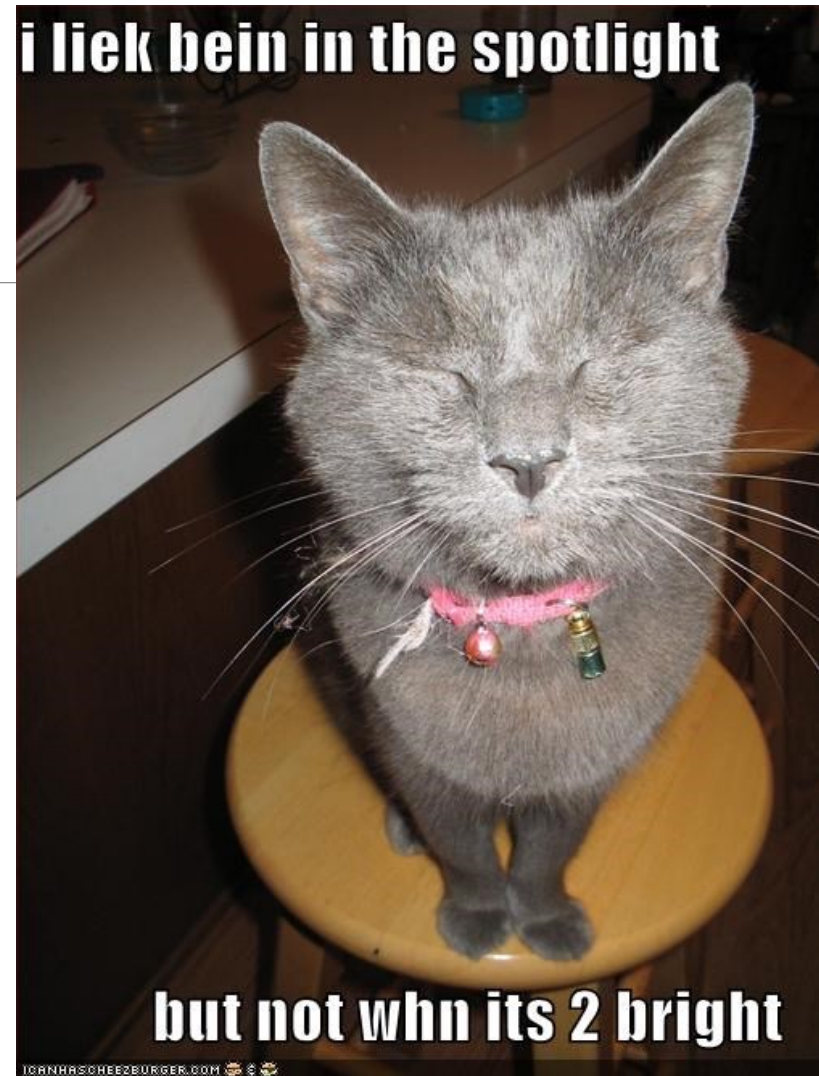
- ◆ Let people read in peace, especially quotes

“Anyone who has never made a mistake has never tried anything new.”
- Albert Einstein

- ◆ In powerpoint: B(lack) or W(hite)
- ◆ Move (instead of laser pointing)
- ◆ Don't be afraid of silence.

Find the spotlight

If you are
dazzled, that's
good



Microphones

Always use, if there's an option

On your chin, like an icecream

Gesture with one hand.



Online tips

Strong light on your face

Minimise junk behind you

Stand up, so you can gesture

Use a mic/headset (minimize background noise)

Camera at face level

Powerpoint – Set up show as Window (Individual browsing)

Use second computer logged in as a participant.

Other tips

Get there early and test

Bring a back up copy in a different format (PDF, USB)

Wear clothes you feel good in

Presentation checklist

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Add a bit of magic



Values, emotions and idiosyncracies

Connect with your audience

Share yourself

Own who you are

“Be yourself: everyone else is taken”

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How to connect with a human

Stories about characters

Emotional journeys – status changes

Right and wrong

High stakes

Beauty and horror



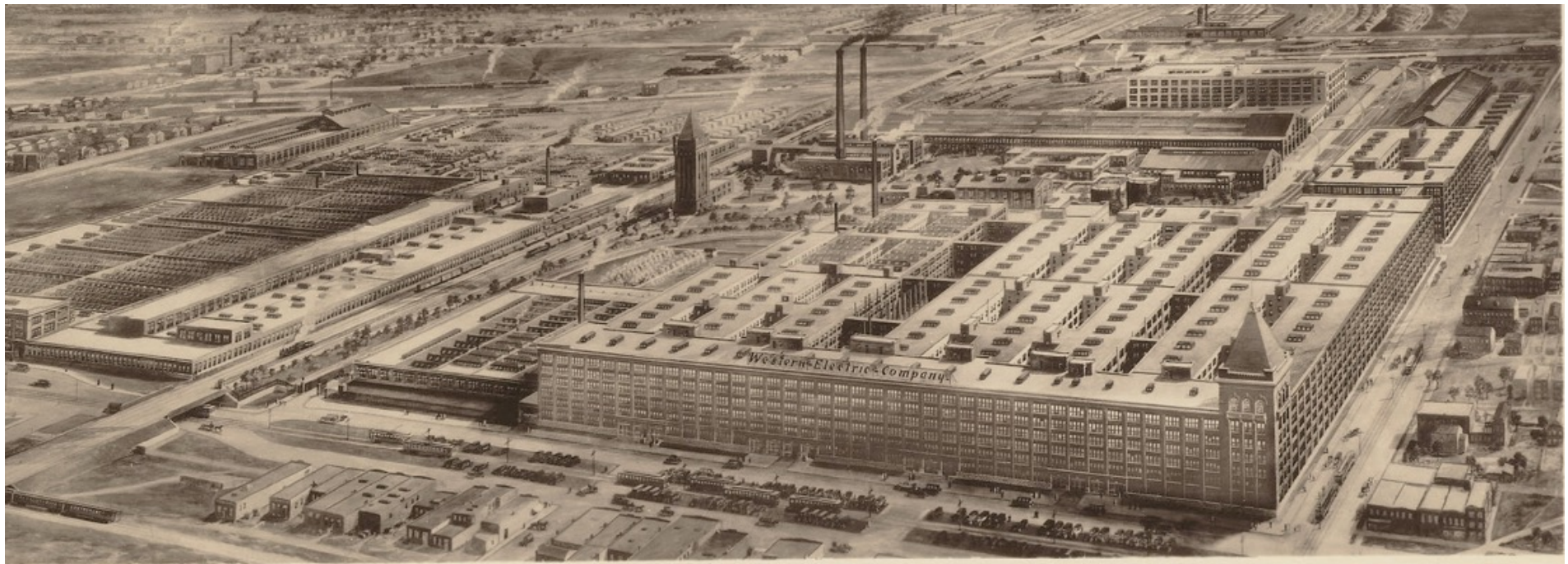
IT'S NOT GOOD SCIENCE

Jokes – YES!



Comedy is a learnable skill

The Hawthorne Effect



Hawthorne works. Image, Western Electric Co

Include the arts



Dopamine hits

(Pokie Nation)

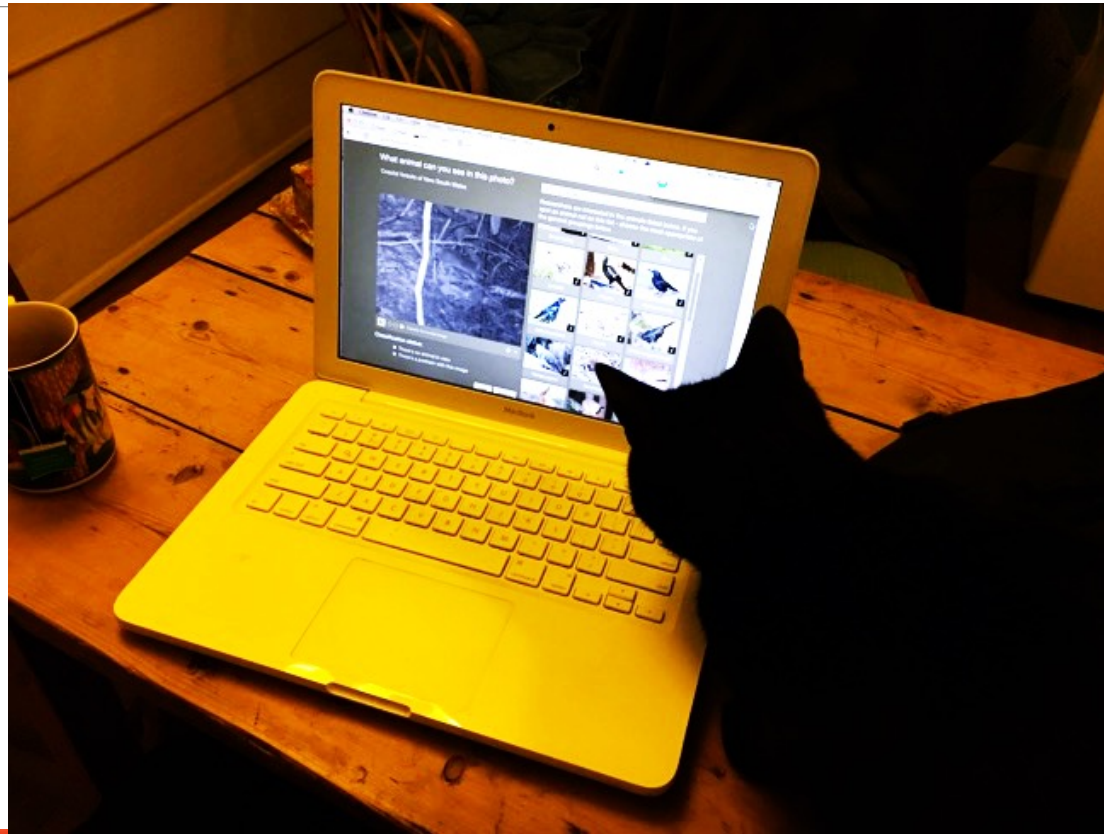


mycroyance on flickr.com



gchampeau on flickr.com

Wildlife spotter- ABC citizen science



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Winners, losers and the human struggle



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Buddha's nostril – Todai-ji



Fredrik Rubensson on flickr.com



hslo on flickr.com

Quizzes

Are great

- keep them quick (e.g. multiple choice)
- clear answer delivery
- Beware of too much audience interaction

Raise the stakes by singling out competitors

- Beware of humiliation



More ideas

A children's story (Janine Deakin)

Lyrics to a song (a Capella Science on YouTube)

Rhyming couplets (e.g. Dr Seuss – Kiara Bruggeman on PhilUpOnScience)

Art – imagery, photography (Shirty Science, Maddie Hartill-Law)

A play or sketch (I have a grant to do this with scientists)

Caveats

Take the p*ss out of yourself, not others

Don't let distraction steal the story



Dr Matt Taylor, Rosetta mission

Get out there!

Your skills and experience make you an EXPERT.

- Even in areas outside your exact expertise
- At least more than some movie star on Instagram!

First time might not be brilliant, but you will improve!

But the Trolls!

Trolls will always find something to complain about.

Don't waste your time with caveats to pre-empt them

(pick your battles)



Voice and Body

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Comfortable and relaxed

To be comfortable and relaxed you need

- Rapport with your audience
- Content you are happy with
- To feel comfortable in the environment

This will reflect in your body and voice

... but don't worry, it's a two-way relationship

change your voice and body and you'll feel better

Clap snap boogie

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Kun ja

Bunny Bunny

Pokey Pokey

Ye haa

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Shoo Fing

Pow - boing

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Whish Whoosh

Connect with audience.

Receive their energy

Do your thing calmly and deliberately

Body



Status

Use high status body language on stage.

- Erect, solid posture
- Open body language
- Positive, engaged expression
- Eye contact
- Slow, deliberate movements
- Stay forward



Warm Ups

Pull the barge, pick the apple and put it in the basket

Stretch – W10

Erect – heels to crown of head

Loosen arms and legs

Smile

--- Ctrl-Save

Voice



Ever heard a speaker who was too loud?

Open the pipe!

No hissy breathing

Loosen whole body,
esp shoulders and
face

Breathe to tummy



Tongue forward

Mouth: Don't open too far

Yawn

Soft palate/nasalness: ng-aaa

Use full vocal range

Hey, that's my car!

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Hey, that's my < ... >!

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Emphasis

Slow

Dramatic pauses

Deeper range of voice

Compare with nervousness

Why can't scientists...

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The 8-second question

High schoolers particularly need time.

- you need to out-awkward them



Nerves – they're natural (& always there)

Split breath – in: half nose, half mouth. Out: mouth

Relax your arms, feel feet on the floor

Open, high status body language

Focus on the next thing to do – don't dwell on mistakes

Smile

Thanks!

Contact me if you:

- Want a more detailed workshop
- Need some writing done
- Want a science pub night put on
- Need a video made
- Like watching science comedy videos

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