Technically Speaking

An Illustrated Guide for Presenting Research

Tony Eng

Patrick Yurick

MIT gradx

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AN ILLUSTRATED GUIDE FOR PRESENTING RESEARCH

By
Tony Eng

Art By
Patrick Yurick

Script By
Tony Eng &
Patrick Yurick

Art Assists By
Leanne Brennen

Editorial Assists
Heather Konar

MIT gradx

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77 Massachusetts Ave, Cambridge, MA 02139
(617) 253-1000

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Foreward

I have been privileged to work with Tony Eng as he developed and constantly improved 6.UAT, a required course designed to help MIT EECS seniors improve their communication skills. The lessons learned in this course have recently been translated into a Communication Comic, which is finally being released after more than a year of prototyping. I am honored to have been asked to write an introduction.

One might ask 'MIT is focused on science and engineering, so why a required course on communication?' To answer this, it is helpful to recognize that "engineer" is both a noun and a verb. An engineer must have the knowledge to work in his or her field, but an engineer must also have the communication, teamwork and leadership skills to work together with others to "engineer" or implement a product or a process. Similarly, a scientist seeks to "discover" new principles, but to do this he/she must go through the process of discovery, which also requires working effectively with others. During my 35 years as a practicing engineer, I've leaned that just knowing something, or having an idea for a discovery, doesn't make it happen. It takes teamwork, advocacy, and inspiration.

Without effective communication, teamwork cannot take place. Communication provides the instruction, the coordination, the connection, the strategic discussion, and the constant feedback. Except for a limited number of cases, projects or research in the real world get done by teams of people. Each person on the team has a contribution to make, but it requires effective communication between the team members to actually make this happen.

Communication skills can often be difficult to teach, in part because students are strongly locked in to the patterns and inhibitions that they developed when they were young. By using comics, Tony shifts the conversation to a new level wherein he bypasses deep-seated neural inhibitions and avoids verbal explanations. Instead, he illustrates basic communication principles through simple visual comics which communicate directly and viscerally to the limbic mind where insight is based. These insights free the mind to explore and develop in new directions.

Joel Schindall
Professor of the Practiice, MIT EECS
Founder, Bernard Gordon-MIT Engineering Leadership Program
SB, MS, PhD in EECS, MIT

Dr. Schindall returned to MIT in 2002 as a professor of the practice in EECS, and later helped to propose, design and implement the Bernard Gordon-MIT Engineering Leadership Program. Prior to that he spent 35 years in design and leadership positions in the telecommunications and satellite industry. He received his BS, MS and Phd degrees in Electrical Engineering from MIT.

Introduction

A student once asked me if I had written a book about presentation skills and if so, where they could buy it.

My response was why would anyone want to read a book on how to present? Anything I'd write would just be pure common sense anyway.

I used to teach an introductory computer science course, and it was challenging to come up with ways to explain technical material and rewarding to see a light go on when a student finally got something. But a nontechnical soft skills class was just not the same. Everything is simply put, obvious. There were no deep insights. No aha moments. I missed seeing light bulbs go off. What's more, one day someone would realize that all I did was teach people what they know or should have known. I constantly tweaked the course and experimented with different approaches, activities and assignments, hoping to create something that would be perceived by the students as being valuable. The only consolation I had was that even though they should have known these things, they didn't know how to (or remember to or were too lazy to) incorporate them into the design and delivery of their talks. And so,my course would at the very least remind them of the obvious.

Then in Summer of 2016, Patrick Yurick asked if I would help create an online course in Graduate Communications. I didn't think that would be an effective way to teach oral communication, but he mentioned that he hoped to use comics in some capacity. Comics? Intriguing. A non-obvious way to convey the obvious. A fun medium for students to read about a mundane topic like presentation skills. I'm in.

With the help of Francis Chen (who is a great sounding board and sanity checker) and Patrick Yurick (whose artistic touch brought the comics to a whole new dimension), six comics were initially created. Each comic contains a nugget of communication advice, and the intention was for other contributors (1) to augment the collection by creating comics with additional nuggets of advice, and for educators (2) to use the resulting collection as an educational resource for teaching materials in the courses that they teach— they could build a custom experience around nuggets (comics) of their choosing.

The comics can be read individually or in sequence (for the latter, we give one possible ordering here). The hope is that they remind you of things to be aware of and possibly things you'll want to try doing in your presentations. Everything can be adapted; anything can be ignored so long as your audience isn't bothered by it. Because in the end, you're not giving the presentation for your sake (you already know the material); you've giving it for theirs. I know I know. That's common sense, right?

- Tony Eng

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KEEPING AUDIENCE IN MIND

TONY ENG PATRICK YURICK

LIMITED EDITION


SUPPOSE YOU'RE TRYING TO COMMUNICATE WITH SOMEONE WHO'S JUST LEARNING YOUR NATIVE LANGUAGE.
WHAT ARE SOME THINGS YOU CAN DO TO INCREASE THE PROBABILITY THAT THEY'LL UNDERSTAND YOU?
gradx PRESENTS
KEEPING AUDIENCE IN MIND
CHOOSING THE RIGHT WORDS
STARRING
TONY ENG
WRITTEN BY
TONY ENG
SCRIPT BY
TONY ENG & PATRICK YURICK
ART BY
PATRICK YURICK
ART ASSISTS
LEEANNE BRENNEN
EDITORIAL ASSISTANCE
HEATHER KONAR
THIS COMIC IS PART OF A LARGER PROFESSIONAL DEVELOPMENT EXPERIENCE FOR GRADUATE STUDENTS TO AID AND ENHANCE RESEARCH COMMUNICATION SKILLS. THIS COMIC, AND OTHER RESOURCES LIKE IT, ARE AVAILABLE ONLINE AT:
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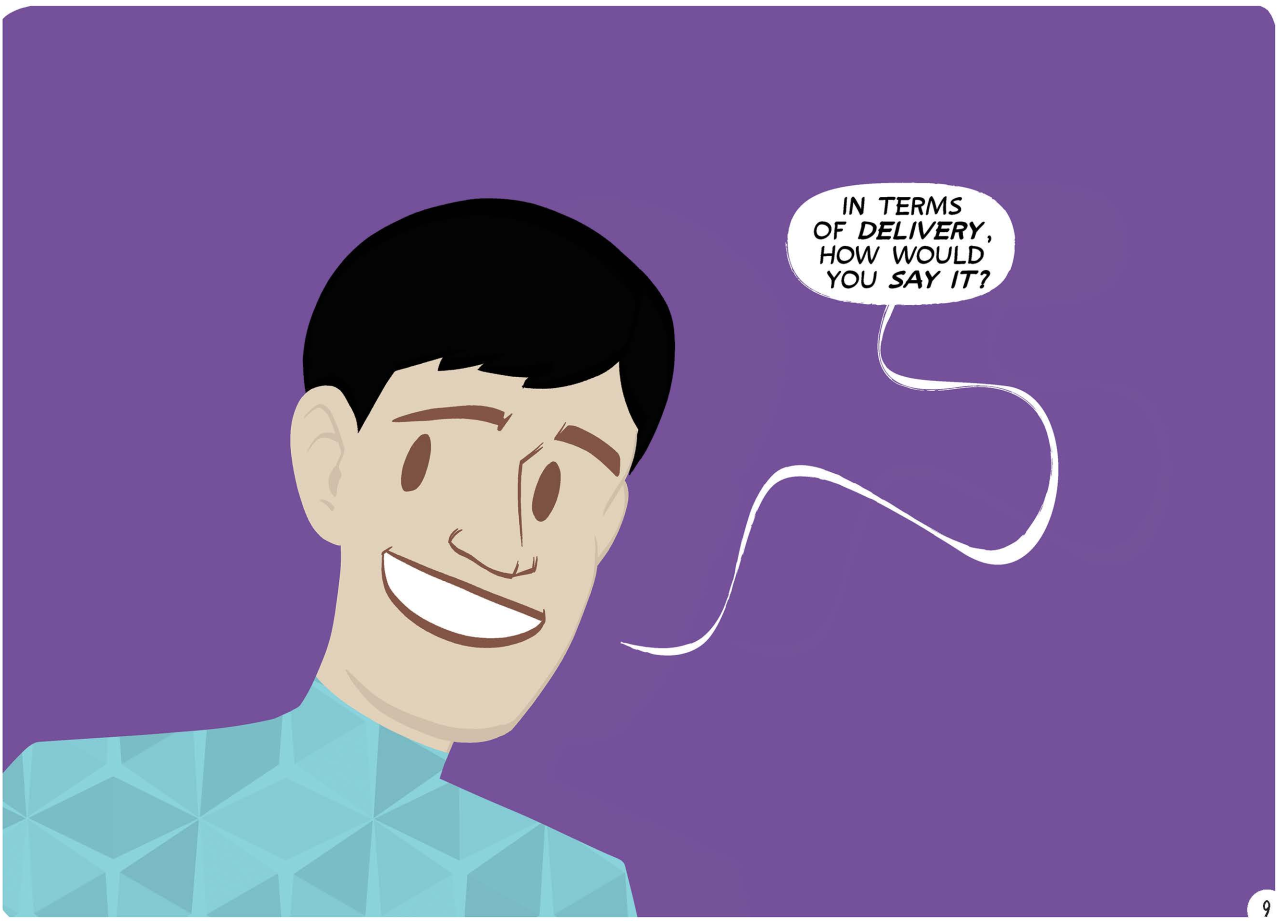
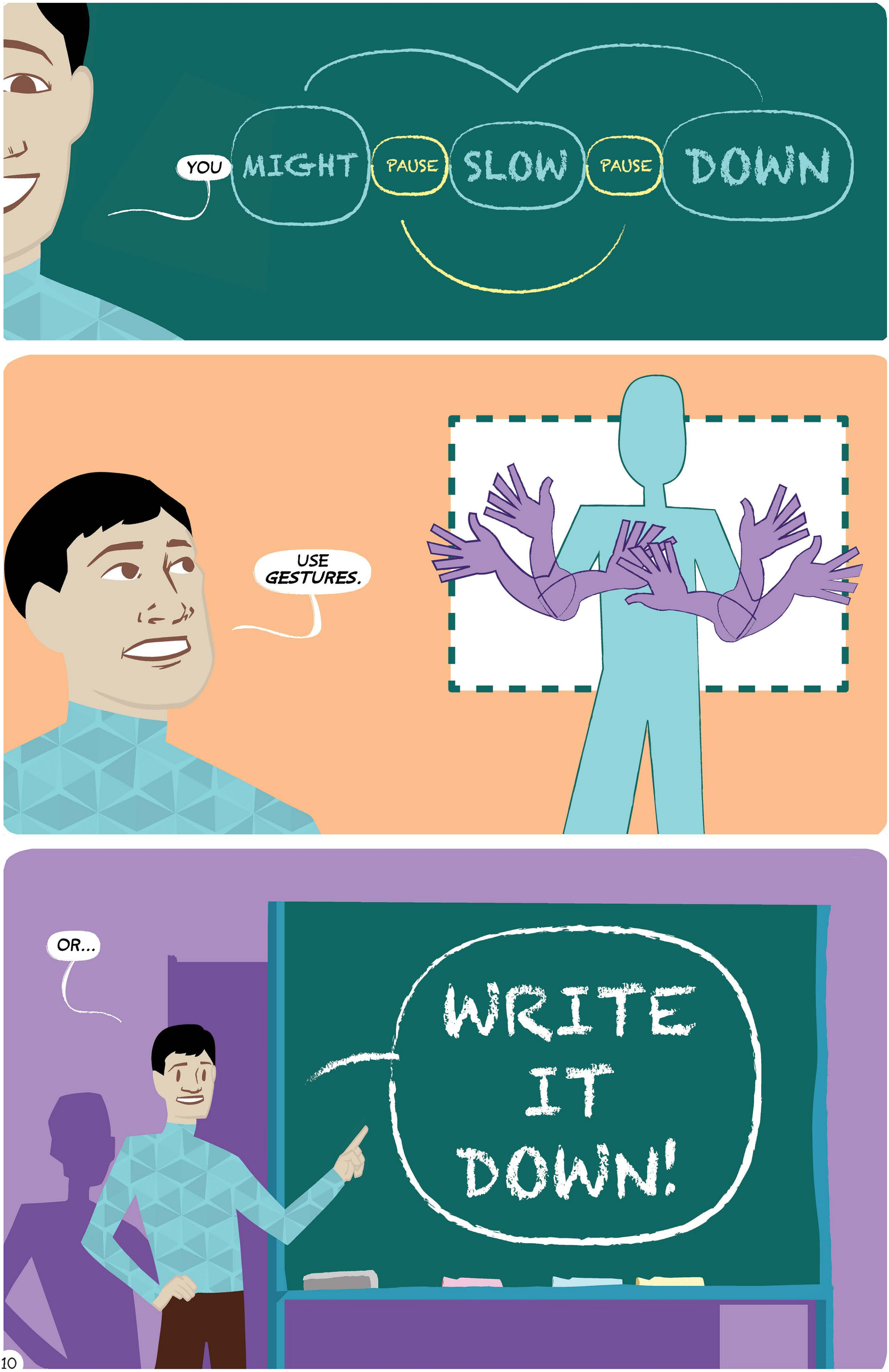
IN TERMS OF CONTENT WHAT WOULD YOU SAY?
NO DICE
DIDN'T WORK OUT
WASN'T SUCCESSFUL
I LUCKED OUT
I WAS VERY LUCKY
OVER MY DEAD BODY
I'M AGAINST IT
I WASN'T BORN YESTERDAY
I'M NOT NAIVE
YOU MIGHT AVOID SLANG AND USE SIMPLE GRAMMAR.
DANKE


IN TERMS OF DELIVERY, HOW WOULD YOU SAY IT?


YOU
MIGHT
PAUSE
SLOW
PAUSE
DOWN
USE GESTURES.
OR...
WRITE IT DOWN!

WHAT IF IT'S AN *ELDERLY PERSON?*
BFF = BEST FRIENDS FOREVER
LMGTFY = LET ME GOOGLE THAT FOR YOU...
BOGO = BUY ONE GET ONE
YOU MIGHT ADJUST FOR THINGS THEIR *GENERATION* ISN'T AWARE OF.
YOU MIGHT *REPEAT THINGS* AND *SPEAK LOUDER.*
AND, IF YOU'RE COMMUNICATING WITH *TEXT* YOU MIGHT USE A-
-BIGGER FONT SIZE.
NO NEED TO *SHOUT*-
-*SONNY.*
BFF = BEST FRIENDS FOREVER
BOGO = BUY ONE GET ONE

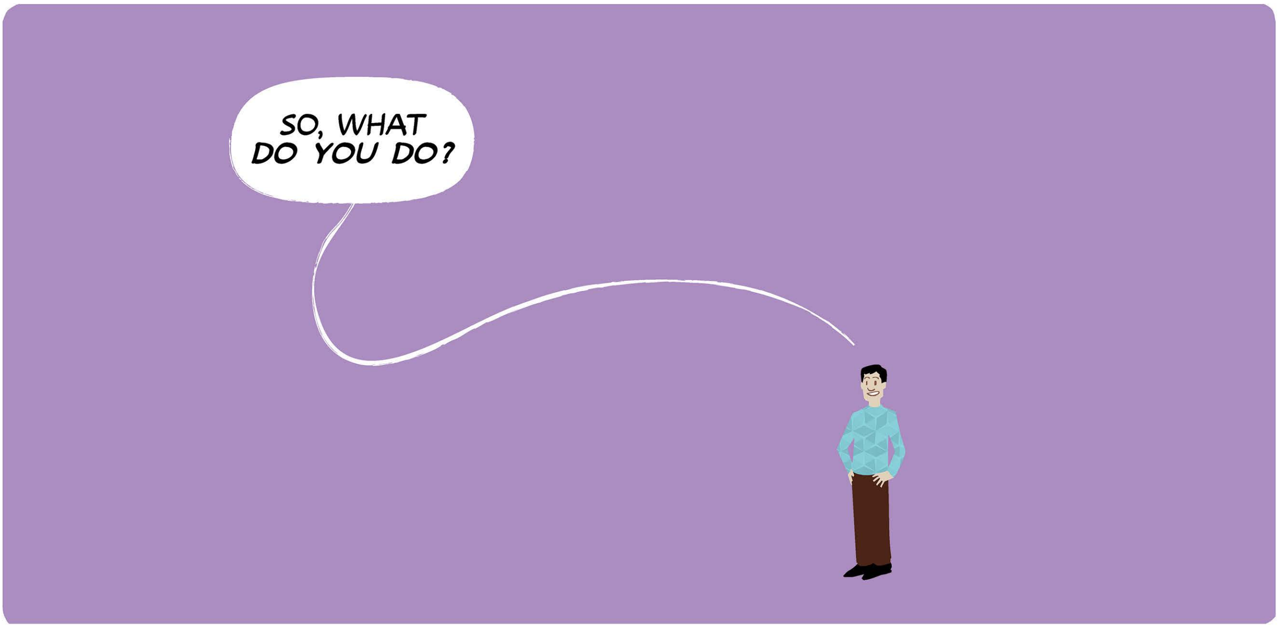

LAST EXAMPLE:
WHAT IF IT'S A *TODDLER?*
WELL, THERE YOU WOULD USE *SIMPLE WORDS.*
ZZZZOOMMMMM
INSTEAD OF SAYING *"SWELTERING"*
SWELTERING
HOT HOT!
SCALDING
HOT HOT OUCHIE!
YOU *MIGHT* SAY-
HOT HOT!
AND, **AGAIN,** YOU'D *SLOW DOWN,*
REPEAT,
AND PROBABLY USE A **GENTLE,** *HIGHER-PITCHED,* VOICE.
ZOOMMMM
ZZOOMMMM


THESE ARE **THINGS** THAT MOST OF US ALREADY KNOW *HOW TO DO.*
YOU ADJUST BOTH **WHAT YOU SAY** AND **HOW YOU SAY IT** TO YOUR ***AUDIENCE***.


INSTEAD OF JUST ACCOUNTING FOR **LANGUAGE**, **ABILITY**, AND **AGE** YOU WANT TO ALSO CONSIDER ***TECHNICAL BACKGROUND.***
BECAUSE YOU WILL TALK TO PEOPLE WHO HAVE A LESS **TECHNICAL BACKGROUND** THAN YOU.
SO WHAT ***DO*** YOU ***DO?***

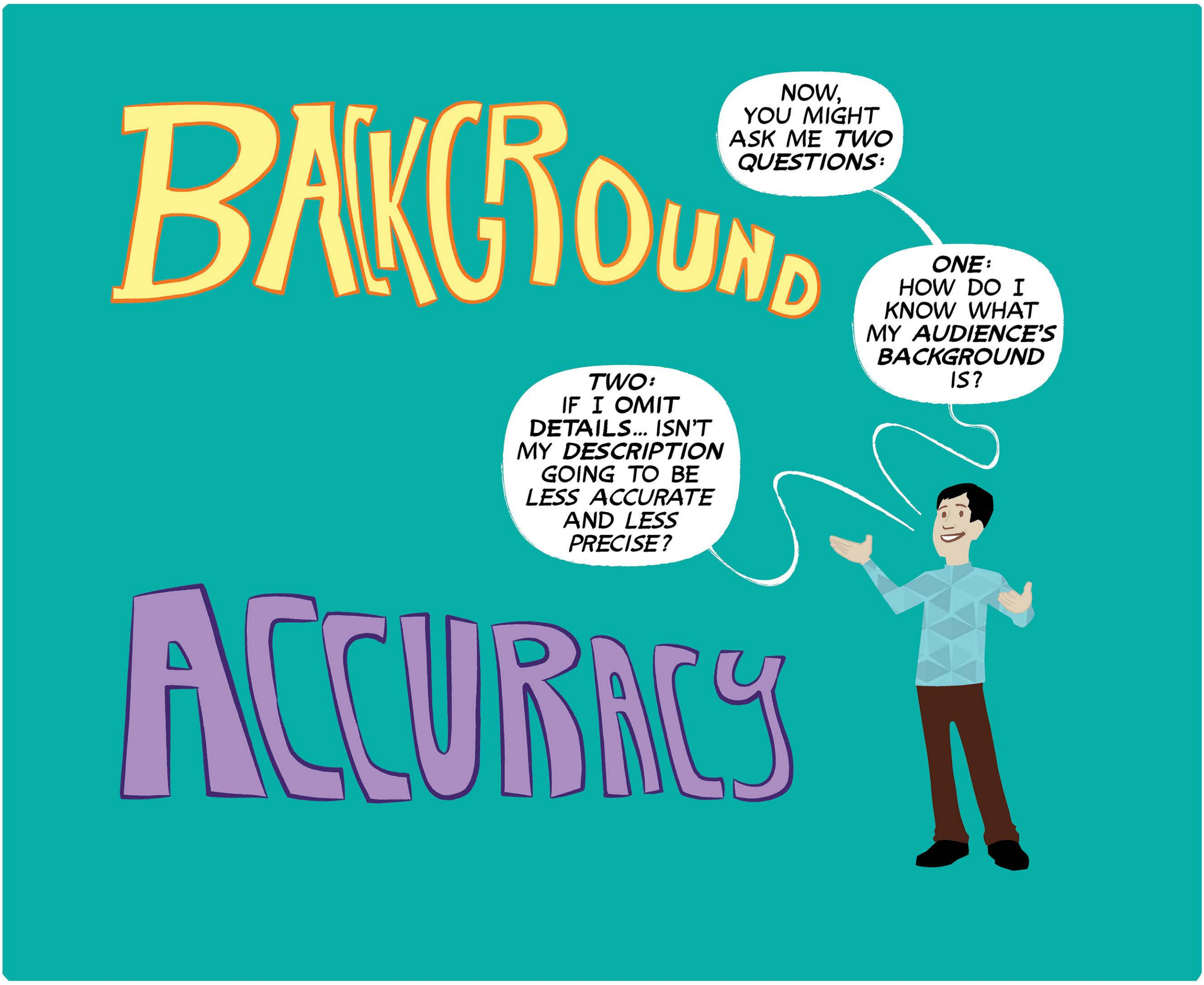

YOUR CHILD PRESENTS WITH ACQUIRED ACCOMMODATIVE ESOTROPIA AND POSSIBLE AMBLYOPIA OF THE RIGHT EYE RELATED TO STRABISMUS.
WE ARE GOING TO FOCUS ON CONTENT.
IN PARTICULAR, WHAT MIGHT INTERFERE WITH YOUR AUDIENCE'S UNDERSTANDING OF YOUR MESSAGE?
JARGON
JARGON
JARGON
JARGON.


JARGON CAN DESCRIBE SOMETHING *CONCISELY & PRECISELY*, AND IS CONVENIENT TO USE WITH YOUR *TECHNICAL PEERS*,
BUT OTHERWISE, IT IS AN **UNNECESSARY** AND **UNWIELDY** *HURDLE* FOR THOSE WHO ARE *NEW* TO YOUR FIELD AND **UNFAMILIAR** WITH ITS *TERMS*.
BEWARE OF
JARGON
AND IF WE LOOK BACK AT SOME OF THE *EXAMPLES* MENTIONED EARLIER IN THE COMIC, THAT'S REALLY **THE PROBLEM** ISN'T IT?
TERMS THAT *MEAN NOTHING* TO YOUR AUDIENCE.
WITH THE *NON-NATIVE ENGLISH SPEAKER*, YOU **AVOID** *SLANG*.
WITH *THE ELDERLY*, YOU AVOID *POP CULTURE REFERENCES*.
WITH *THE TODDLER*, YOU **AVOID WORDS** THEY HAVEN'T *YET ACQUIRED*.
IN THE **END**, WHAT YOU ARE TRYING TO DO IS MINIMIZE *UNFAMILIAR TECHNICAL JARGON* AND, INSTEAD, USE WORDS THAT YOUR AUDIENCE *UNDERSTANDS*.

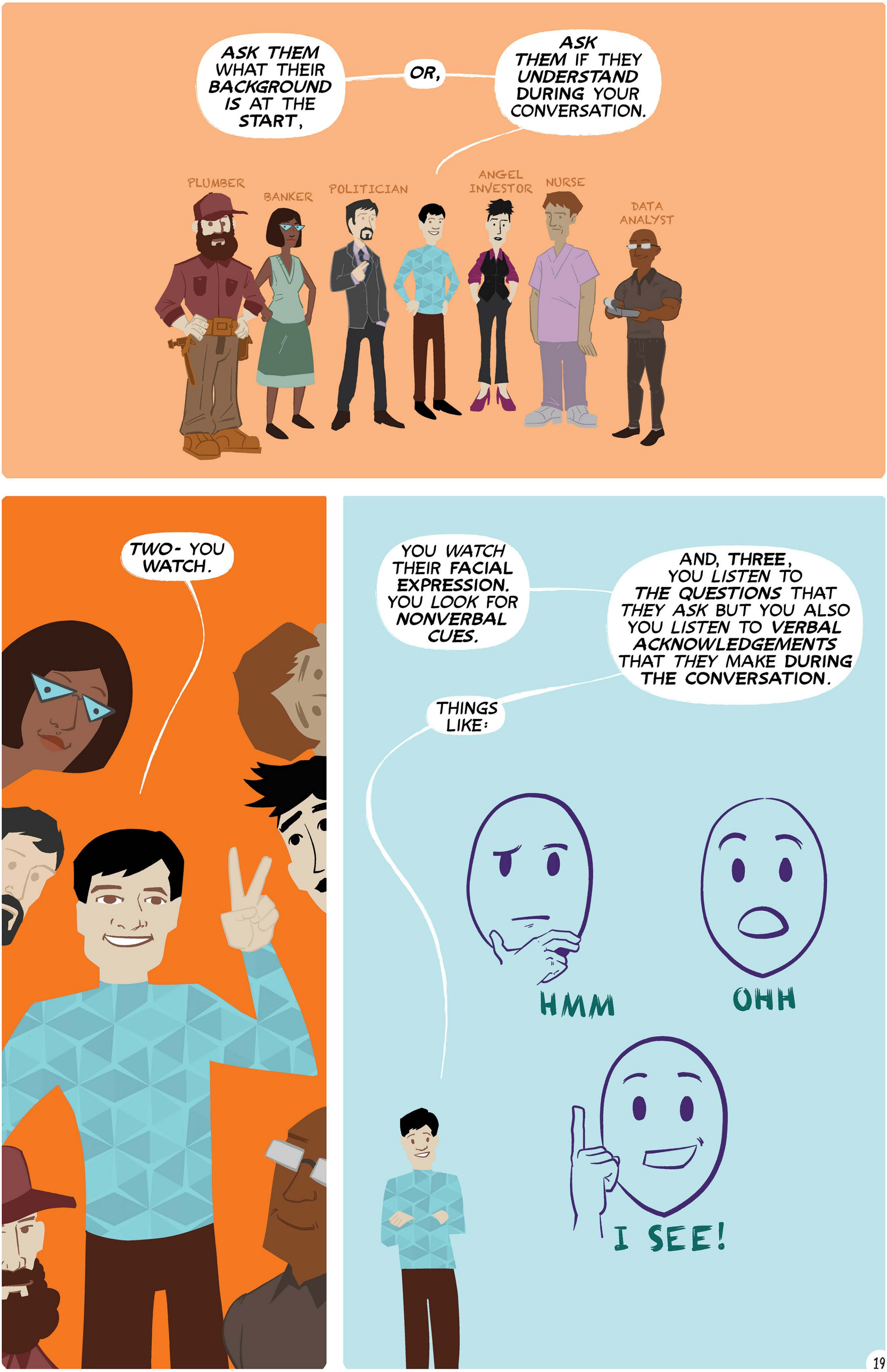

SO, WHAT DO YOU DO?

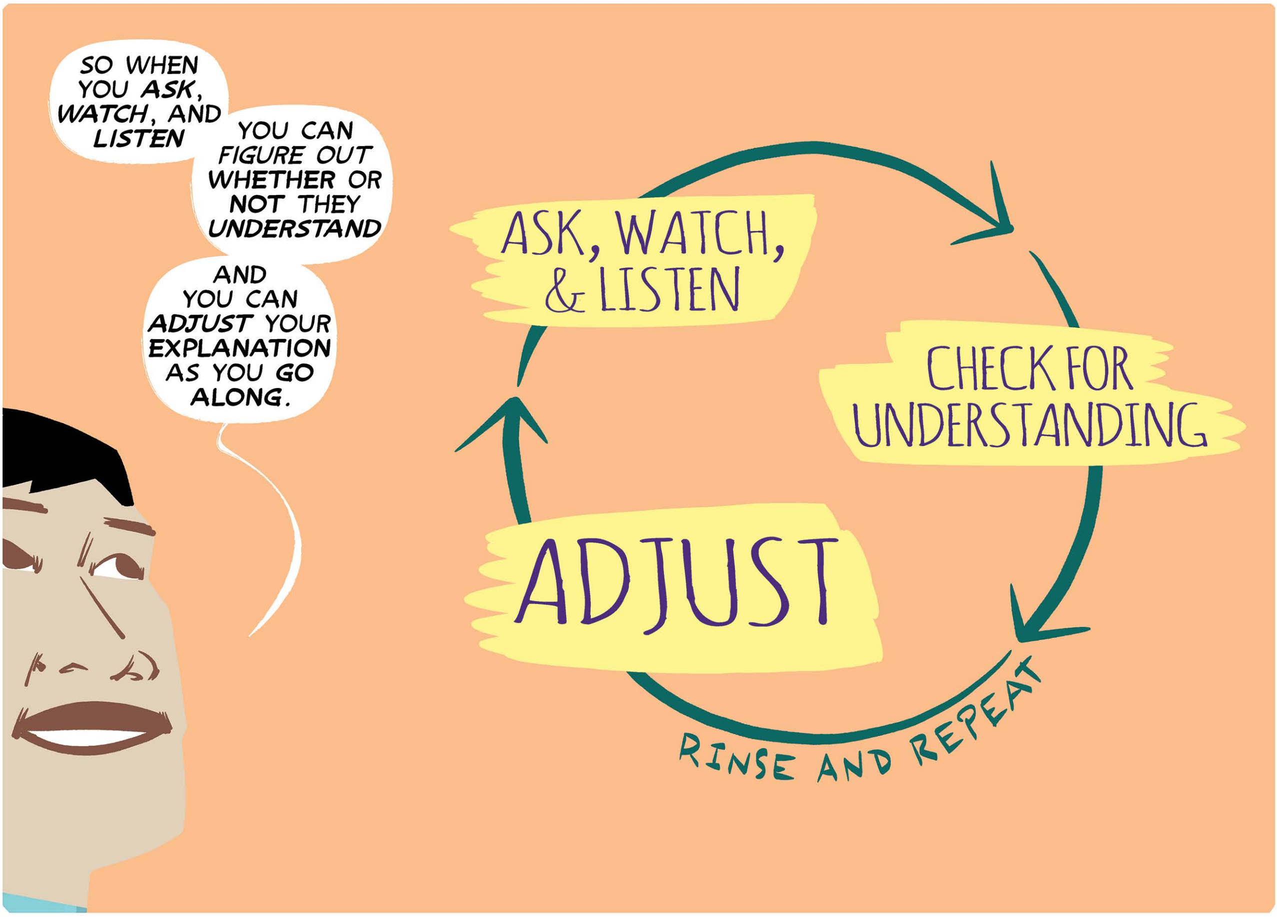

YOUR CHILD'S EYES ARE POORLY ALIGNED,
BUT BECAUSE THEY ARE TRYING TO FOCUS TO SEE CLEARLY, THE RIGHT EYE IS CROSSING INWARDS AS A RESULT.
IT MAY EVEN BE THAT HER BRAIN FAVORS THE LEFT EYE OVER THE RIGHT.
PEDIATRICS
WELL, FIRST, ASK YOURSELF IF THE AUDIENCE NEEDS TO KNOW A PARTICULAR TERM OR DETAIL.
AND, IF NOT, OMIT IT AND JUST SAY IT IN PLAIN, SIMPLE, TERMS.


POSTER SESSION
YOUR CHILD HAS STRABISMUS IN WHICH THE EYES ARE MISALIGNED. IN THIS CASE, INWARDS....
SOMETHING IS BOOLEAN IF IT ONLY HAS TWO VALUES, FOR EXAMPLE: TRUE OR FALSE, OR 0 AND 1.
BOOLEANS CAN BE STORED IN YOUR COMPUTER WITH A SINGLE BIT OF MEMORY.
IF YOU WANT THEM TO KNOW A TERM-
(E.G. IT'S A VERY BASIC TERM THAT WILL KEEP COMING UP AND IS HANDY TO ESTABLISH AND ADD TO THEIR VOCABULARY),
THEN YOU MIGHT DEFINE IT,
OR-
YOU COULD RENAME IT TO SOMETHING THAT'S LESS INTIMIDATING AND/OR SOMETHING THE AUDIENCE CAN RELATE TO.
BOOLEAN LOGIC GATES
CALL IT "SPOOKY ACTION AT A DISTANCE" IF YOU WILL...
QUANTUM ENTANGLEMENT
AS A SIDE NOTE-
WHEN POSSIBLE USE A NAME THAT DESCRIBES WHAT IS BEING DONE INSTEAD OF HOW IT'S BEING DONE.
SO LET'S REFER TO THESE PROBLEMS AS BEING "EASY TO CALCULATE", BUT THESE OTHER ONES AS "EASIER TO CHECK THAN TO CALCULATE."
POSTER SESSION
WETLAB OPERATIONS
P?=NP
JUDGE
WHEN YOU USE WORDS YOUR AUDIENCE IS FAMILIAR WITH, THAT MEANS ANY JARGON FROM THEIR TECHNICAL FIELD IS FAIR GAME FOR YOU TO USE.
(EVEN IF THEIR FIELD IS DIFFERENT FROM YOURS)
A GEL AND A MASS SPECTROMETER CAN BASICALLY SORT MOLECULES - BY SIZE AND BY MASS RESPECTIVELY.

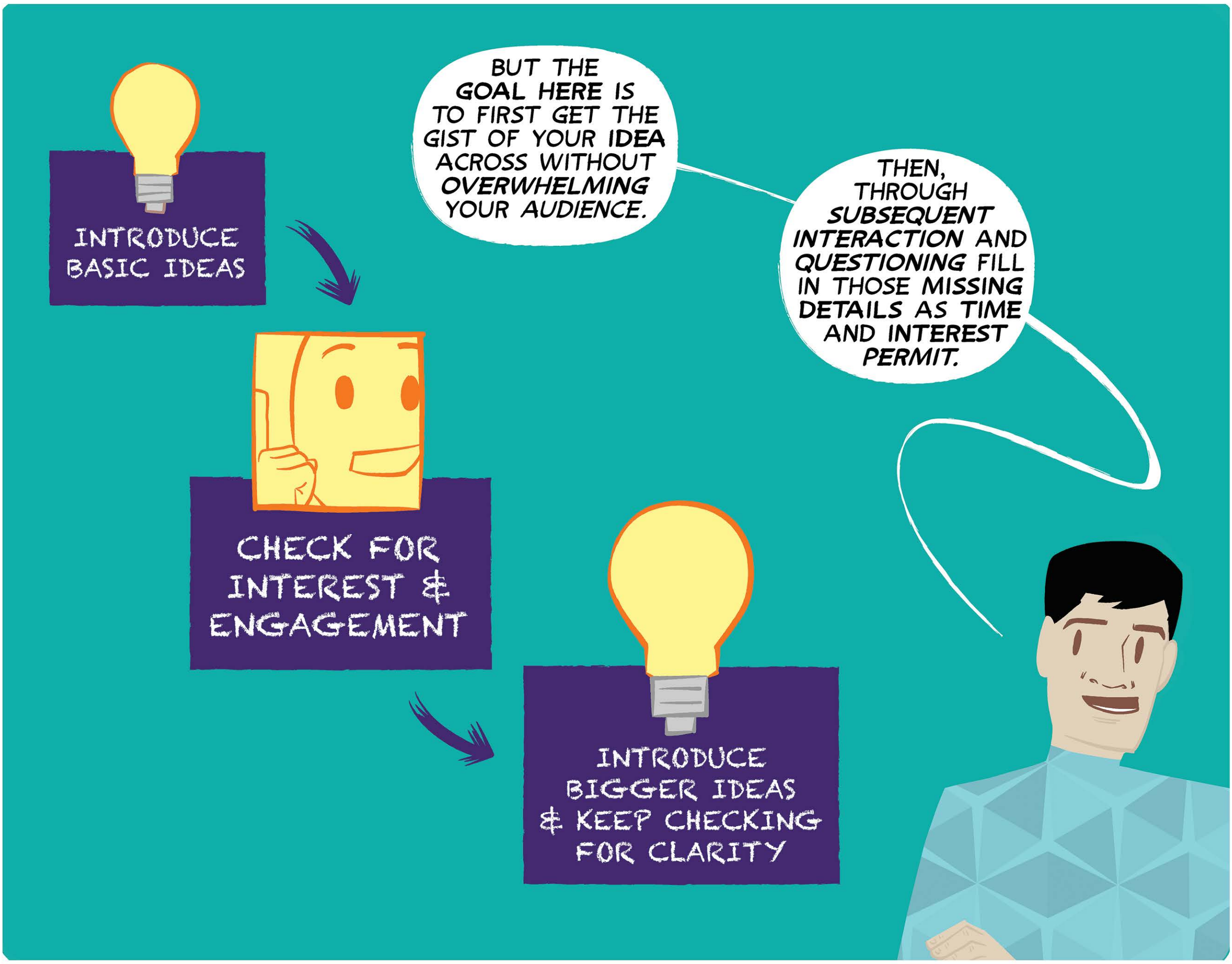

BACKGROUND
ACCURACY
NOW, YOU MIGHT ASK ME TWO QUESTIONS:
ONE: HOW DO I KNOW WHAT MY AUDIENCE'S BACKGROUND IS?
TWO: IF I OMIT DETAILS... ISN'T MY DESCRIPTION GOING TO BE LESS ACCURATE AND LESS PRECISE?


HOW DO WE KNOW?
WELL...
YOU ASK.


ASK THEM WHAT THEIR BACKGROUND IS AT THE START,
OR,
ASK THEM IF THEY UNDERSTAND DURING YOUR CONVERSATION.
PLUMBER
BANKER
POLITICIAN
ANGEL INVESTOR
NURSE
DATA ANALYST
TWO- YOU WATCH.
YOU WATCH THEIR FACIAL EXPRESSION. YOU LOOK FOR NONVERBAL CUES.
AND, THREE, YOU LISTEN TO THE QUESTIONS THAT THEY ASK BUT YOU ALSO YOU LISTEN TO VERBAL ACKNOWLEDGEMENTS THAT THEY MAKE DURING THE CONVERSATION.
THINGS LIKE:
HMM
OHH
I SEE!


SO WHEN YOU ASK, WATCH, AND LISTEN
YOU CAN FIGURE OUT WHETHER OR NOT THEY UNDERSTAND
AND YOU CAN ADJUST YOUR EXPLANATION AS YOU GO ALONG.
ASK, WATCH, & LISTEN
CHECK FOR UNDERSTANDING
ADJUST
RINSE AND REPEAT


WHAT ABOUT THE SECOND QUESTION?
BY REMOVING JARGON AND DETAILS ARE YOU MAKING THINGS LESS ACCURATE AND MORE GENERAL?
YES.
THAT'S PROBABLY TRUE.


INTRODUCE BASIC IDEAS
CHECK FOR INTEREST & ENGAGEMENT
INTRODUCE BIGGER IDEAS & KEEP CHECKING FOR CLARITY
BUT THE GOAL HERE IS TO FIRST GET THE GIST OF YOUR IDEA ACROSS WITHOUT OVERWHELMING YOUR AUDIENCE.
THEN, THROUGH SUBSEQUENT INTERACTION AND QUESTIONING FILL IN THOSE MISSING DETAILS AS TIME AND INTEREST PERMIT.


SO, IN SUMMARY:


YOU'RE PROBABLY USED TO THE IDEA OF ADJUSTING TO YOUR AUDIENCE BY NOW.
WHY NOT ACCOUNT FOR TECHNICAL BACKGROUND?
SIMPLE VERBIAGE
LEAVE TECHNICAL TERM OUT
DEFINE TECHNICAL TERM
RENAME TECHNICAL TERM
DESCRIBE WHAT, NOT "HOW"
ETC.
YOU CAN REMOVE ONE OF THE BARRIERS TO UNDERSTANDING TECHNICAL CONTENT BY EITHER-
-REMOVING JARGON-
-OR REPLACING JARGON WITH TERMS THAT ARE MORE FAMILIAR.


CHANGING THE WAY YOU DESCRIBE YOUR CONTENT TO FIT WHO YOU'RE SPEAKING TO-
-ALLOWS YOUR MESSAGE TO BECOME MORE ACCESSIBLE-
TO
YOUR
AUDIENCE.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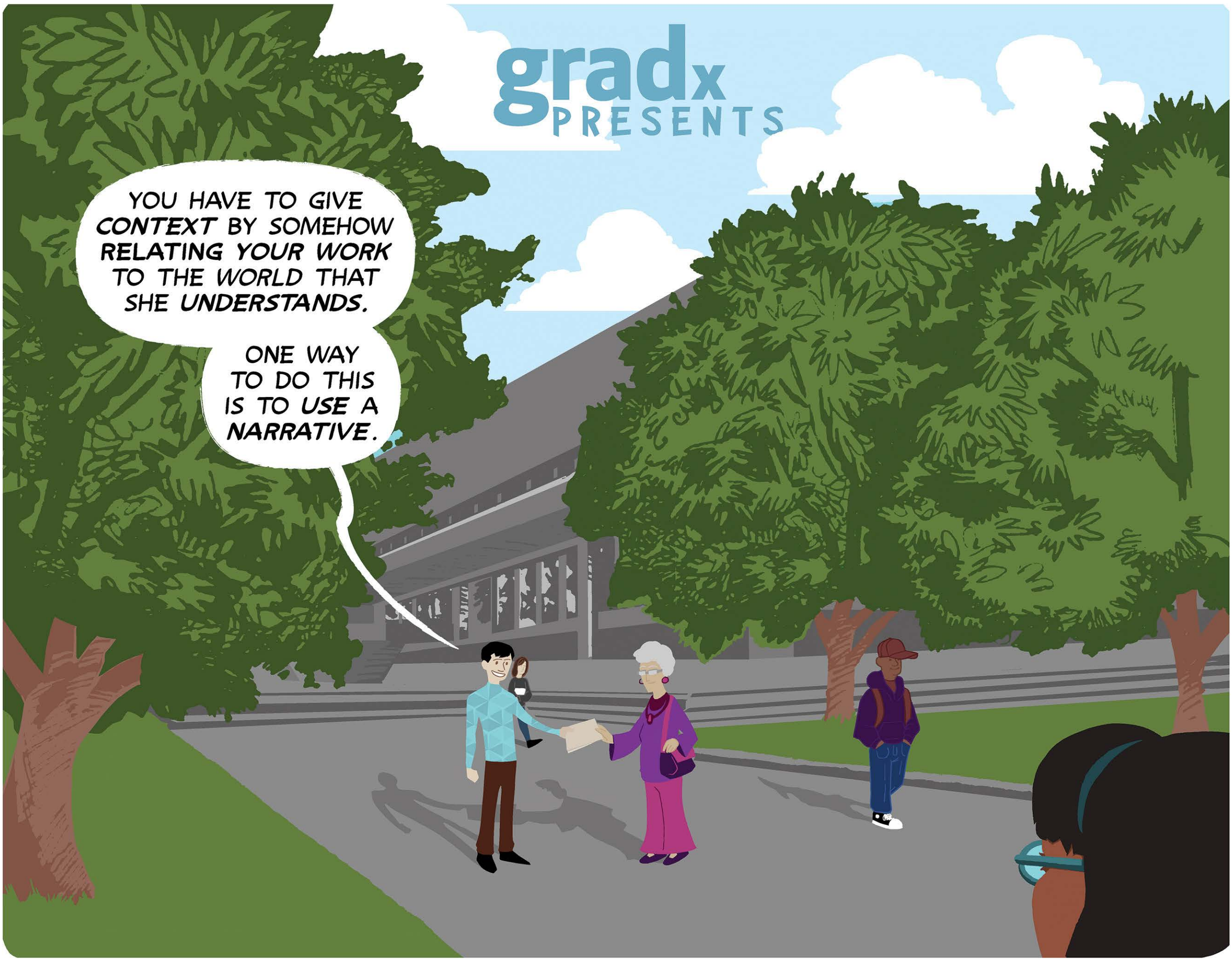
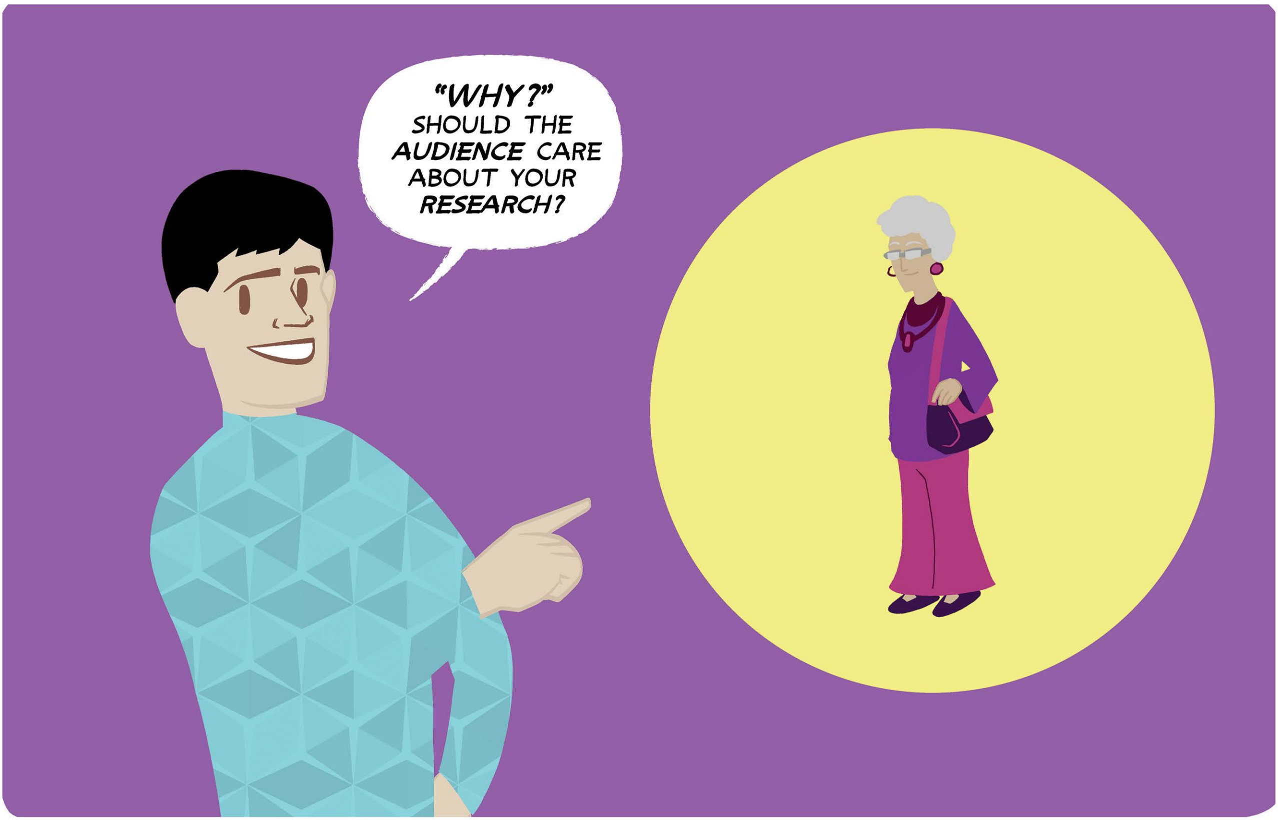
CONTEXT
TONY ENG
PATRICK YURICK
LIMITED EDITION
USING

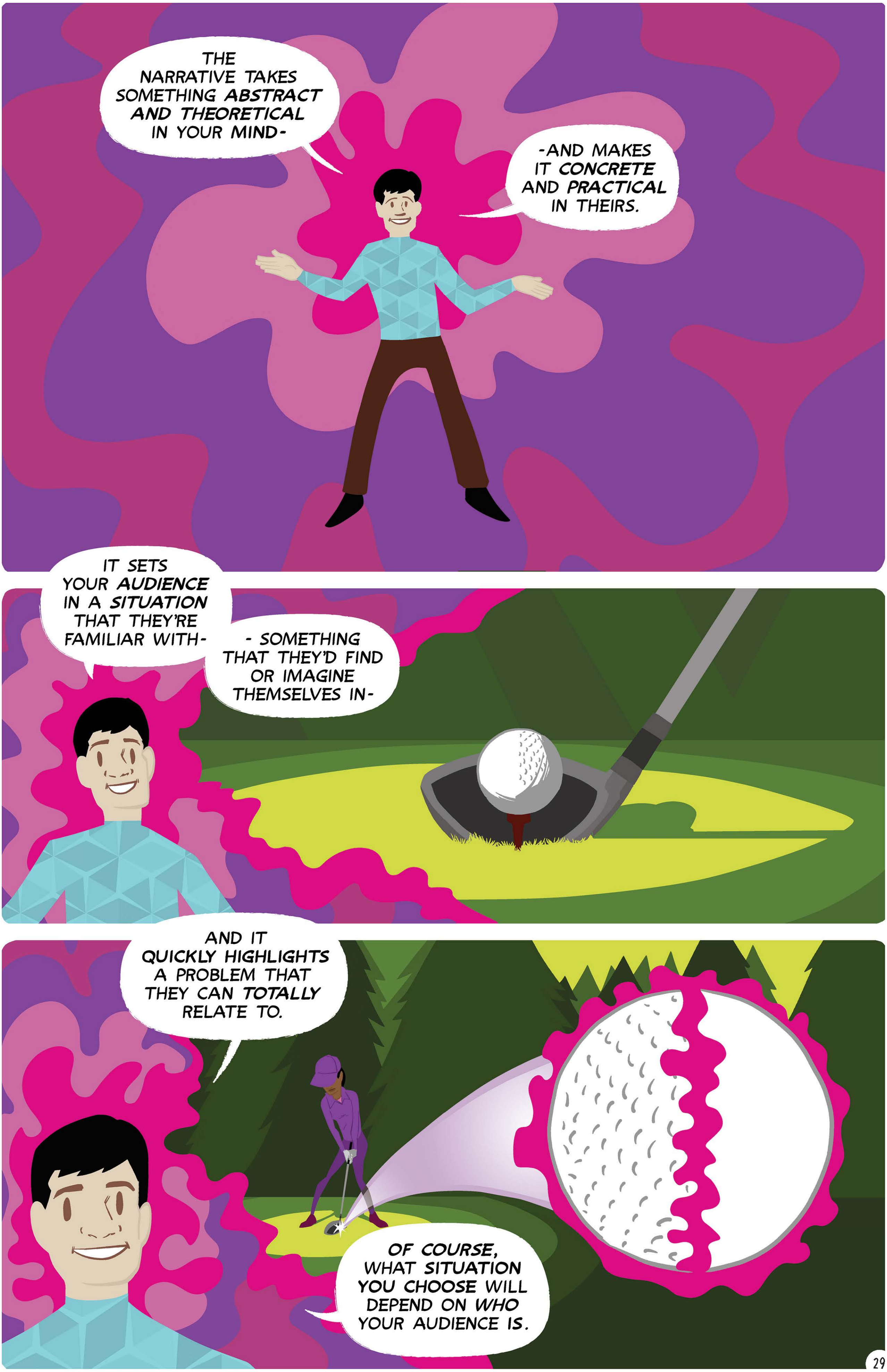

IF YOUR RESEARCH IS VERY TECHNICAL, HOW DO YOU GET A NON-TECHNICAL AUDIENCE -
- LIKE GRANDMA -
- TO APPRECIATE IT.
OOOH...

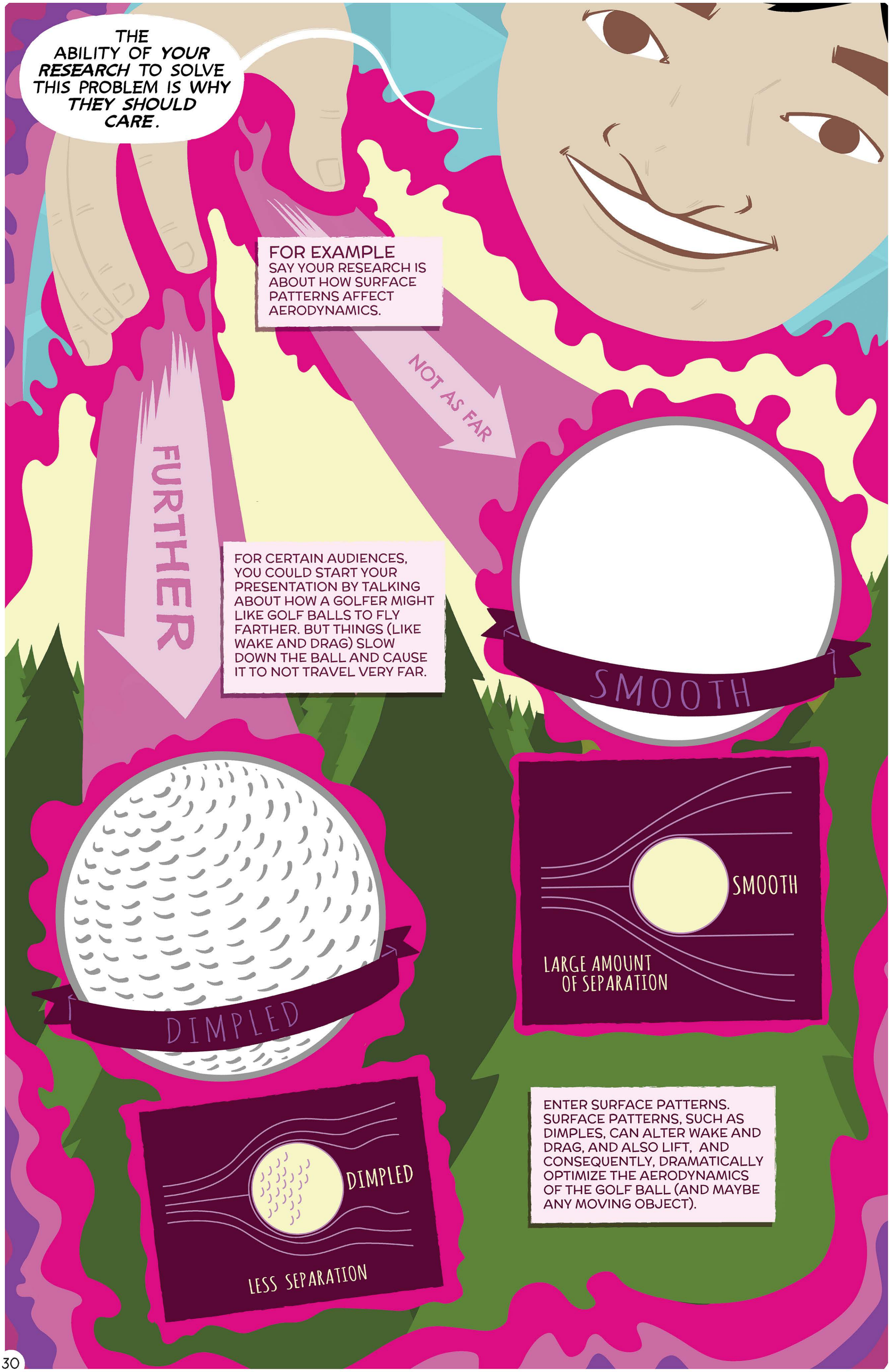

gradx PRESENTS
YOU HAVE TO GIVE CONTEXT BY SOMEHOW RELATING YOUR WORK TO THE WORLD THAT SHE UNDERSTANDS.
ONE WAY TO DO THIS IS TO USE A NARRATIVE.


GIVING CONTEXT
STARRING TONY ENG
NARRATIVE ANSWERS THE QUESTION: "WHY?"
USING NARRATIVE


"WHY?" SHOULD THE AUDIENCE CARE ABOUT YOUR RESEARCH?


WILL IT IMPROVE THEIR LIVES?
OR MAKE SOMETHING EASIER?
ALLOW THEM TO DO SOMETHING THEY COULDN'T DO BEFORE?


THE NARRATIVE TAKES SOMETHING ABSTRACT AND THEORETICAL IN YOUR MIND-
-AND MAKES IT CONCRETE AND PRACTICAL IN THEIRS.
IT SETS YOUR AUDIENCE IN A SITUATION THAT THEY'RE FAMILIAR WITH-
- SOMETHING THAT THEY'D FIND OR IMAGINE THEMSELVES IN-
AND IT QUICKLY HIGHLIGHTS A PROBLEM THAT THEY CAN TOTALLY RELATE TO.
OF COURSE, WHAT SITUATION YOU CHOOSE WILL DEPEND ON WHO YOUR AUDIENCE IS.


THE ABILITY OF *YOUR RESEARCH* TO SOLVE THIS PROBLEM IS WHY *THEY SHOULD* CARE.
FOR EXAMPLE
SAY YOUR RESEARCH IS ABOUT HOW SURFACE PATTERNS AFFECT AERODYNAMICS.
NOT AS FAR
FURTHER
FOR CERTAIN AUDIENCES, YOU COULD START YOUR PRESENTATION BY TALKING ABOUT HOW A GOLFER MIGHT LIKE GOLF BALLS TO FLY FARTHER. BUT THINGS (LIKE WAKE AND DRAG) SLOW DOWN THE BALL AND CAUSE IT TO NOT TRAVEL VERY FAR.
SMOOTH
SMOOTH
LARGE AMOUNT OF SEPARATION
DIMPLED
DIMPLED
LESS SEPARATION
ENTER SURFACE PATTERNS. SURFACE PATTERNS, SUCH AS DIMPLES, CAN ALTER WAKE AND DRAG, AND ALSO LIFT, AND CONSEQUENTLY, DRAMATICALLY OPTIMIZE THE AERODYNAMICS OF THE GOLF BALL (AND MAYBE ANY MOVING OBJECT).


SIX COMMENTS ABOUT NARRATIVE:
1
KEEP IT SHORT BY PROVIDING JUST ENOUGH DETAIL TO GET THE POINT ACROSS.
THERE'S NO TIME FOR THINGS LIKE CHARACTER DEVELOPMENT.
SHORT
2
YOU MAY NOT ACTUALLY BE APPLYING YOUR RESEARCH TO SOLVE THE SPECIFIC PROBLEM IN YOUR NARRATIVE AND THAT'S OK.
IT'S JUST AN ILLUSTRATION OF WHAT'S POSSIBLE IN THEORY AND IS ONLY MEANT TO BE AN EXAMPLE APPLICATION THAT YOUR AUDIENCE CAN WRAP THEIR MINDS AROUND.
3
MAKE A NARRATIVE MORE PERSONAL BY TELLING IT IN THE SECOND PERSON.
YOU
YOUR
YOURS


4
DON'T KNOW HOW TO START? TRY STARTING WITH WORDS LIKE:
IMAGINE
SUPPOSE
IF
&
IF YOU'VE EVER


REMEMBER WHEN PLAY-GROUNDS USED TO BE MADE OF STEEL & WOOD?
YOU'D COME HOME WITH RED RUST STAINS ON YOUR HANDS.
OR, EVEN WORSE-
A SPLINTER!
WOW. I DO REMEMBER.
FOR EXAMPLE
IMAGINE PLAYGROUNDS MADE OF SAFER AND MORE DURABLE MATERIALS INSTEAD.
MATERIALS THAT CAN EASILY BE SHAPED INTO FUN, CREATIVE, STRUCTURES-
INFUSED WITH COLOR, LIGHTS, NETS AND SOUND.
5
NARRATIVE IS AN EFFECTIVE WAY TO ESTABLISH CONTEXT AT THE START A CONVERSATION OR PRESENTATION ABOUT YOUR RESEARCH.
BY THE WAY, YOU DON'T HAVE TO USE THE NARRATIVE FOR THE REST OF THE CONVERSATION OR PRESENTATION...


HOWEVER, IF YOU START WITH A NARRATIVE, COME BACK TO IT AT THE END...
YOU'LL KNOW THAT OUR POLYMER RESEARCH MADE THESE DESIGNS POSSIBLE
AND, SO-
THE NEXT TIME YOU PASS BY A PLAYGROUND -
-NEITHER YOU, NOR YOUR GRANDDAUGHTER, HAVE TO WORRY ABOUT RUST OR SPLINTERS EVER AGAIN.
TALK ABOUT HOW YOUR RESEARCH FIXES THE PROBLEM.
PROVIDING CLOSURE IS A NICE WAY TO FINISH.
6


IN SUMMARY,
NARRATIVE QUICKLY ESTABLISHES CONTEXT.
NARRATIVE DESCRIBES THE PROBLEM YOU ARE SOLVING AND ILLUSTRATES THE IMPACT AND IMPORTANCE OF YOUR RESEARCH IN A RELATABLE WAY.
NOW THAT'S COOL.


ONCE YOUR AUDIENCE UNDERSTANDS WHY YOUR WORK SHOULD MATTER TO THEM-
THEN YOU'VE SET THE STAGE TO BEGIN TO TALK ABOUT WHAT IT IS YOUR RESEARCH-
-ACTUALLY IS.
YOUR RESEARCH
WRITTEN BY TONY ENG
SCRIPT BY TONY ENG & PATRICK YURICK
ART BY PATRICK YURICK
ART ASSISTS LEEANNE BRENNEN
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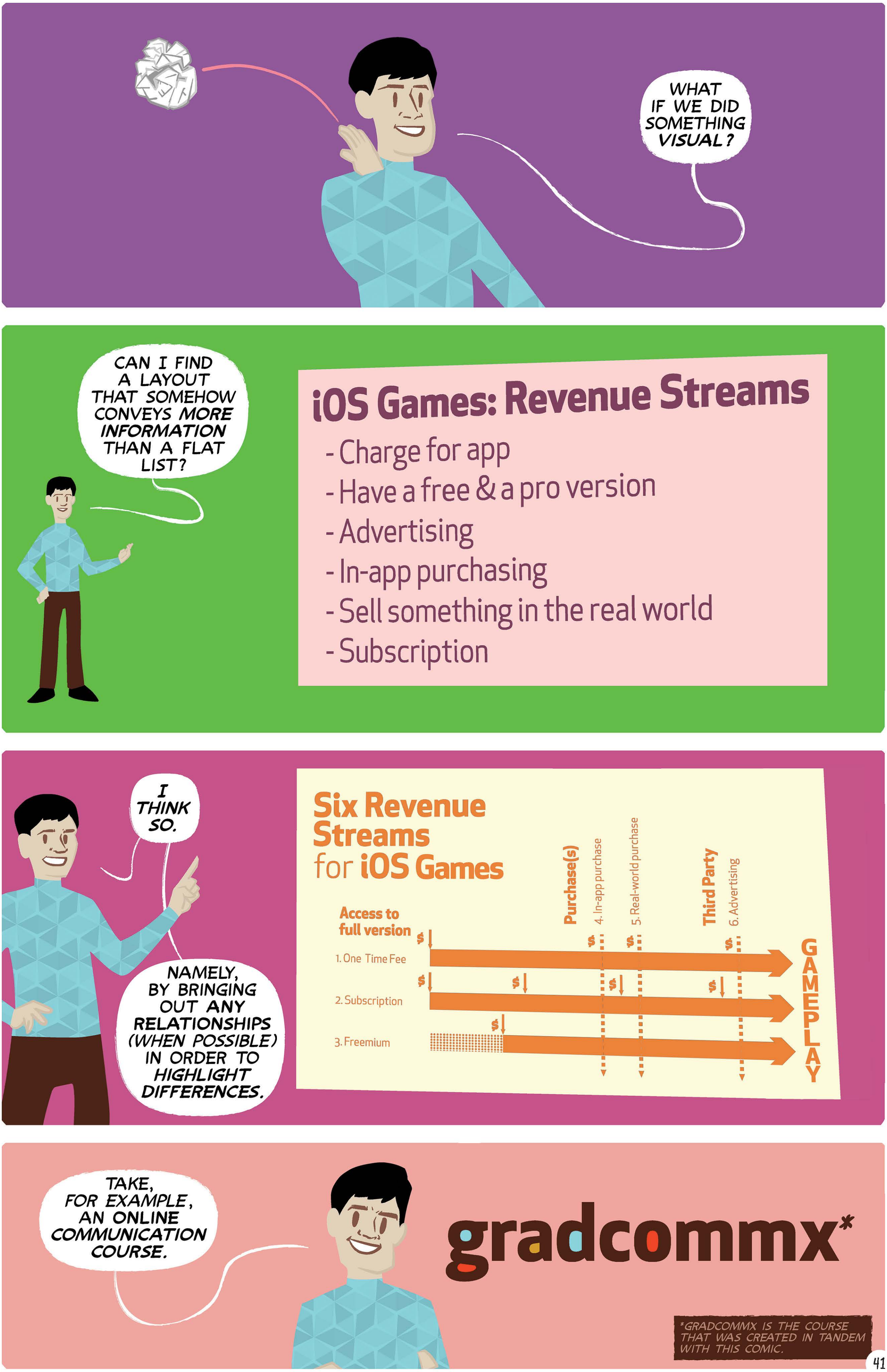
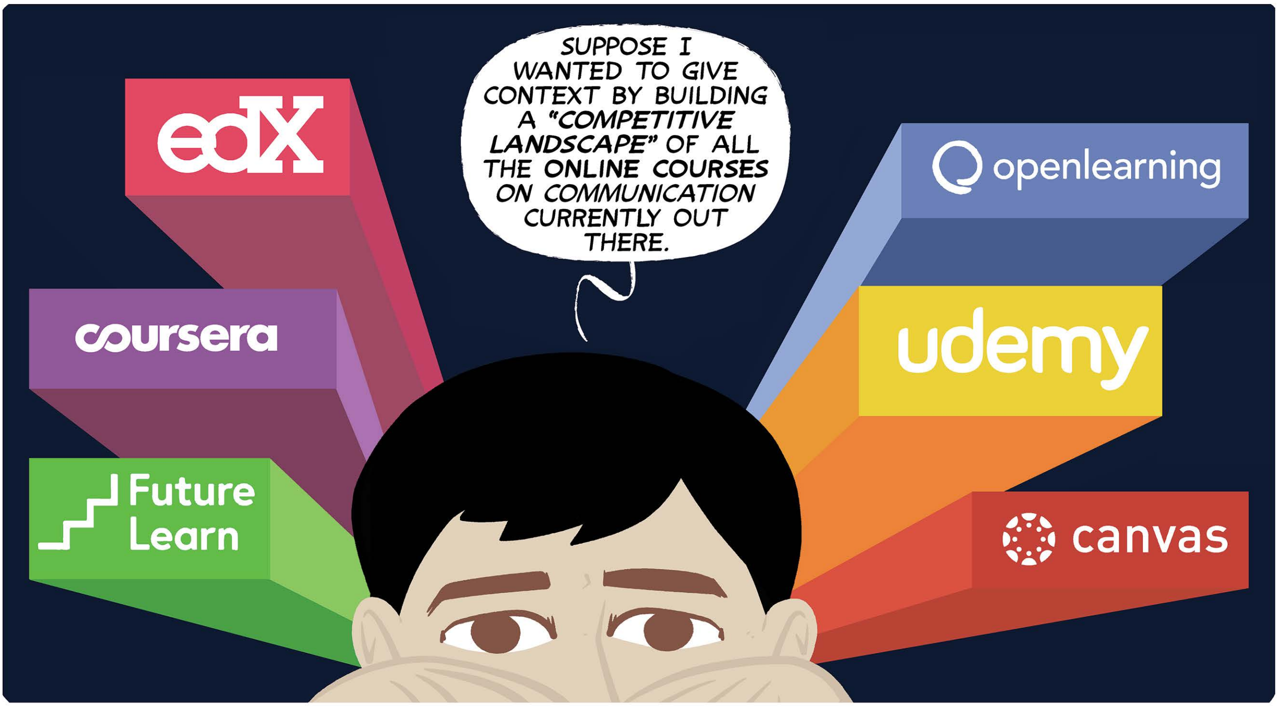
VISUALS HELP THE AUDIENCE SEE YOUR POINT MORE READILY,
Accessibility
Efficiency
AND HELP YOU CONVEY SOMETHING MORE EFFICIENTLY THAN THE VERBAL MESSAGE ALONE.

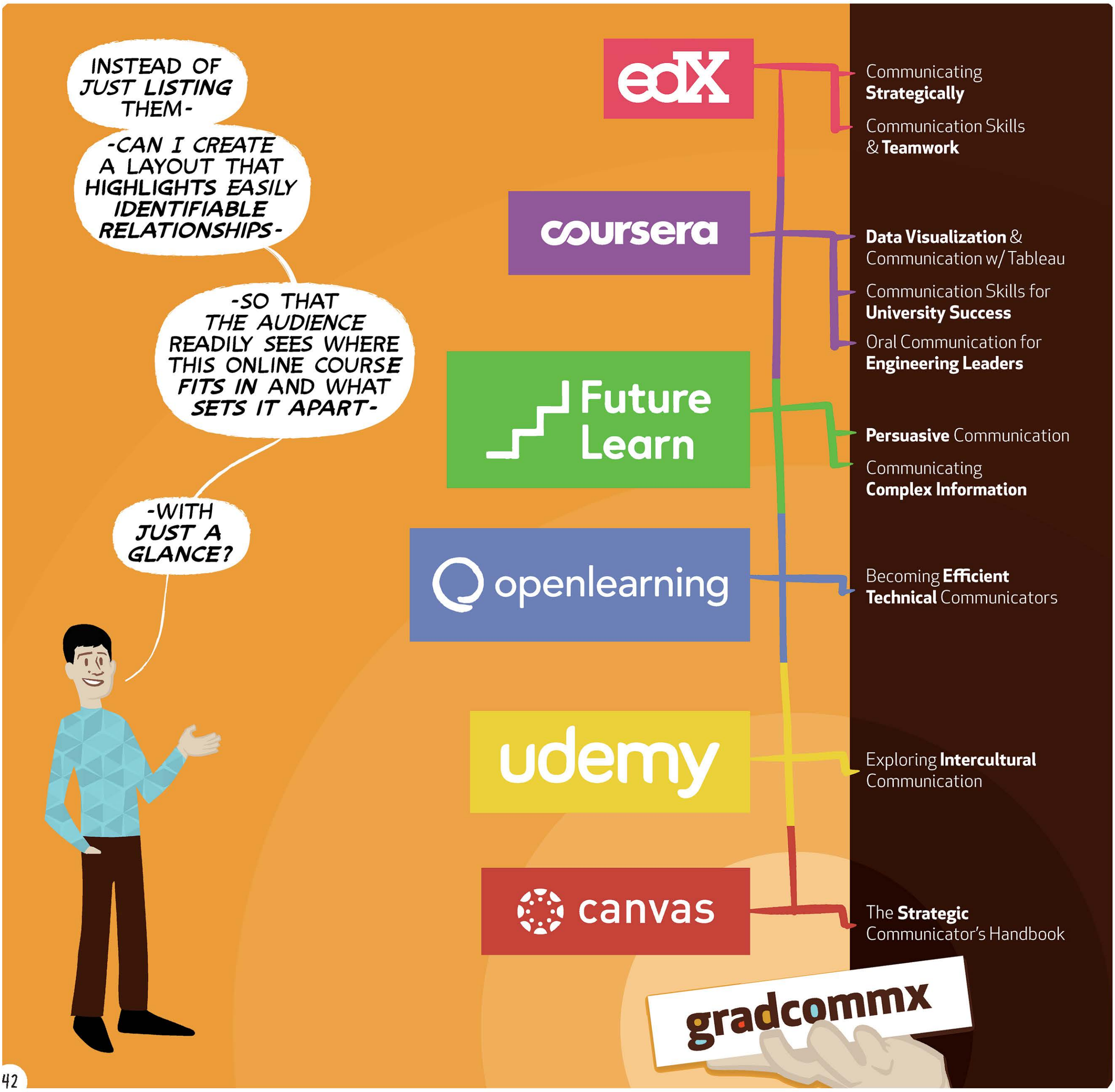

IN PARTICULAR LET'S LOOK AT ONE TYPE OF VISUAL -
-THE LIST.

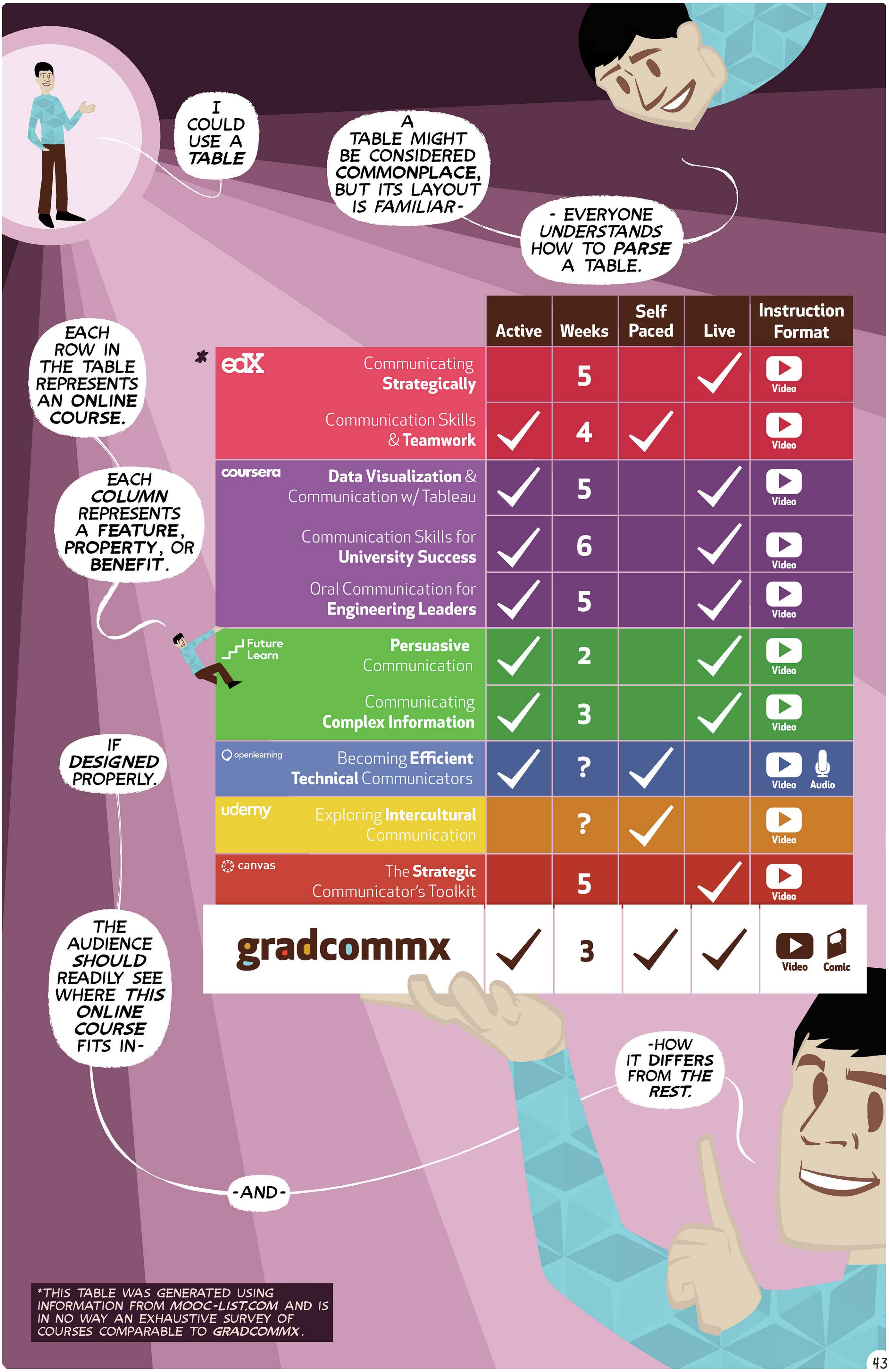

A LONG FLAT LIST OF RELATED ITEMS CAN BE HARD TO REMEMBER AND QUITE BORING.
ESPECIALLY IF THE PRESENTER GOES THROUGH EACH AND EVERY ITEM.
1
2
5
6
7
8
9
10
11
12
13
14
I.E. YOU HAVE TO READ EVERY ITEM IN A LIST TO UNDERSTAND HOW THE ITEMS ARE RELATED TO EACH OTHER.
CAN WE MAKE THE INFORMATION IN A LIST OF RELATED ITEMS MORE EFFICIENTLY ACCESSIBLE?



WHAT IF WE DID SOMETHING VISUAL?
CAN I FIND A LAYOUT THAT SOMEHOW CONVEYS MORE INFORMATION THAN A FLAT LIST?
iOS Games: Revenue Streams
- Charge for app
- Have a free & a pro version
- Advertising
- In-app purchasing
- Sell something in the real world
- Subscription
I THINK SO.
NAMELY, BY BRINGING OUT ANY RELATIONSHIPS (WHEN POSSIBLE) IN ORDER TO HIGHLIGHT DIFFERENCES.
Six Revenue Streams for iOS Games
Access to full version
Purchase(s)
4. In-app purchase
5. Real-world purchase
Third Party
6. Advertising
1. One Time Fee
2. Subscription
3. Freemium
GAMEPLAY
TAKE, FOR EXAMPLE, AN ONLINE COMMUNICATION COURSE.
gradcommx*
*GRADCOMMX IS THE COURSE THAT WAS CREATED IN TANDEM WITH THIS COMIC.


SUPPOSE I WANTED TO GIVE CONTEXT BY BUILDING A "COMPETITIVE LANDSCAPE" OF ALL THE ONLINE COURSES ON COMMUNICATION CURRENTLY OUT THERE.

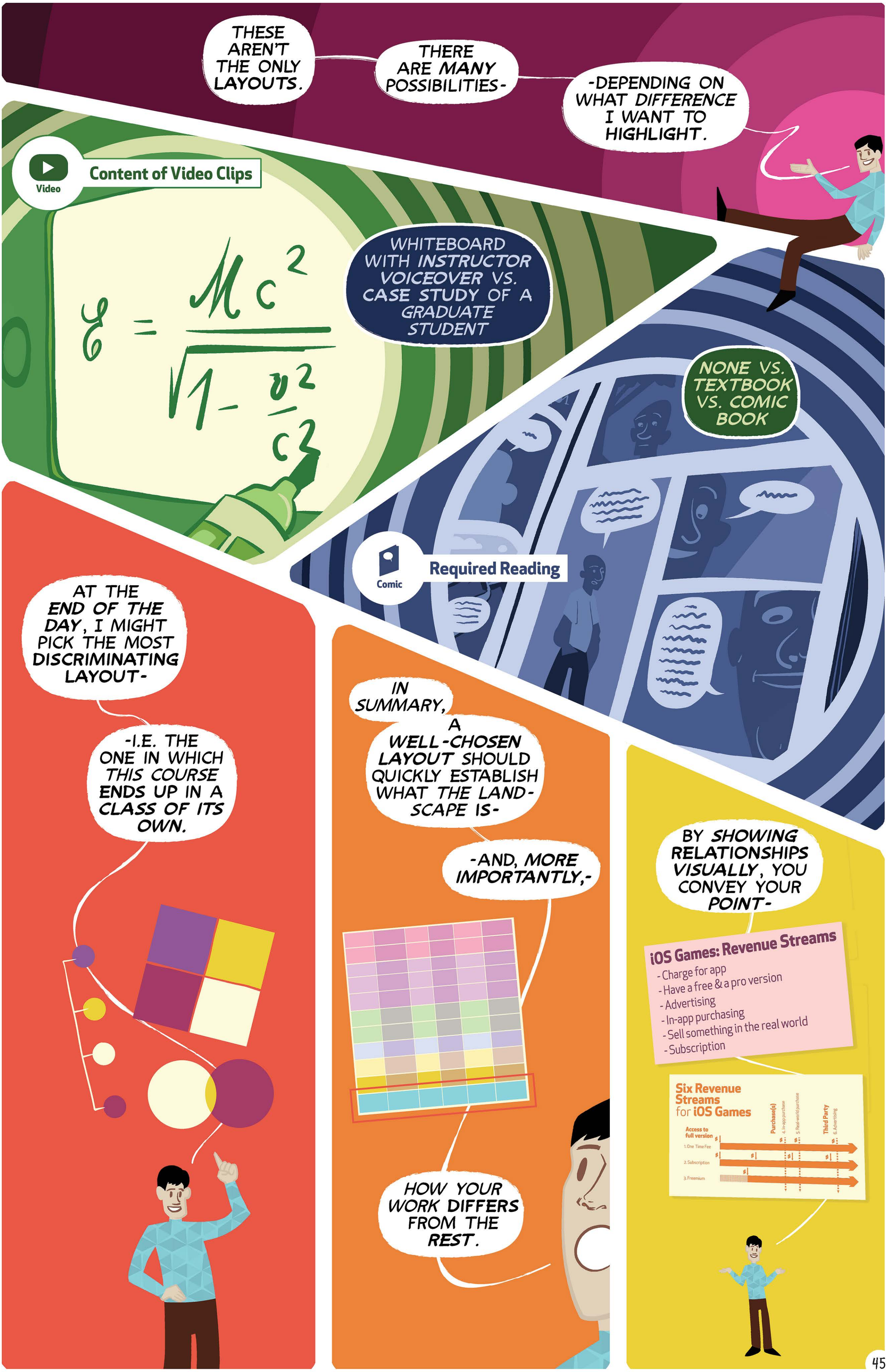

INSTEAD OF JUST LISTING THEM-
-CAN I CREATE A LAYOUT THAT HIGHLIGHTS EASILY IDENTIFIABLE RELATIONSHIPS-
-SO THAT THE AUDIENCE READILY SEES WHERE THIS ONLINE COURSE FITS IN AND WHAT SETS IT APART-
-WITH JUST A GLANCE?
Communicating Strategically
Communication Skills & Teamwork
Data Visualization & Communication w/ Tableau
Communication Skills for University Success
Oral Communication for Engineering Leaders
Persuasive Communication
Communicating Complex Information
Becoming Efficient Technical Communicators
Exploring Intercultural Communication
The Strategic Communicator's Handbook
gradcommx



	Active	Weeks	Self Paced	Live	Instruction Format
* edX — Communicating **Strategically**		5		✓	Video
edX — Communication Skills & **Teamwork**	✓	4	✓		Video
coursera — **Data Visualization** & Communication w/ Tableau	✓	5		✓	Video
coursera — Communication Skills for **University Success**	✓	6		✓	Video
coursera — Oral Communication for **Engineering Leaders**	✓	5		✓	Video
Future Learn — **Persuasive** Communication	✓	2		✓	Video
Future Learn — Communicating **Complex Information**	✓	3		✓	Video
openlearning — Becoming **Efficient Technical** Communicators	✓	?	✓		Video, Audio
udemy — Exploring **Intercultural** Communication		?	✓		Video
canvas — The **Strategic** Communicator's Toolkit		5		✓	Video
gradcommx	✓	3	✓	✓	Video, Comic

*THIS TABLE WAS GENERATED USING INFORMATION FROM *MOOC-LIST.COM* AND IS IN NO WAY AN EXHAUSTIVE SURVEY OF COURSES COMPARABLE TO *GRADCOMMX*.

BESIDES A TABLE,
SELF-PACED
edX Communication Skills & Teamwork
openlearning Becoming Efficient Technical Communicators
udemy Exploring Intercultural Communication
LIVE
edX Communicating Strategically
coursera Data Visualization & Communication w/ Tableau
Communication Skills for University Success
Oral Communication for Engineering Leaders
Future Learn Persuasive Communication
Communicating Complex Information
canvas The Startegic Communicator's Toolkit
gx gradcommx
I COULD HAVE USED A VENN DIAGRAM BASED ON WHETHER A COURSE IS SELF-PACED OR LIVE.


THESE AREN'T THE ONLY LAYOUTS.
THERE ARE MANY POSSIBILITIES-
-DEPENDING ON WHAT DIFFERENCE I WANT TO HIGHLIGHT.
Video
Content of Video Clips
WHITEBOARD WITH INSTRUCTOR VOICEOVER VS. CASE STUDY OF A GRADUATE STUDENT
NONE VS. TEXTBOOK VS. COMIC BOOK
Comic
Required Reading
AT THE END OF THE DAY, I MIGHT PICK THE MOST DISCRIMINATING LAYOUT-
-I.E. THE ONE IN WHICH THIS COURSE ENDS UP IN A CLASS OF ITS OWN.
IN SUMMARY, A WELL-CHOSEN LAYOUT SHOULD QUICKLY ESTABLISH WHAT THE LAND-SCAPE IS-
-AND, MORE IMPORTANTLY,-
HOW YOUR WORK DIFFERS FROM THE REST.
BY SHOWING RELATIONSHIPS VISUALLY, YOU CONVEY YOUR POINT-
iOS Games: Revenue Streams
- Charge for app
- Have a free & a pro version
- Advertising
- In-app purchasing
- Sell something in the real world
- Subscription
Six Revenue Streams for iOS Games
Access to full version
Purchase(s)
Third Party
1. One Time Fee
2. Subscription
3. Freemium
4. In-app purchase
5. Real-world purchase
6. Advertising


Accessibility
-MORE READILY-
Efficiency
-AND HIGHLIGHT DIFFERENCES-
Accessibility
Efficiency
-MORE EFFICIENTLY-
Accessibility
Efficiency
-THAN MERELY USING WORDS-
ALONE.
Accessibility
Efficiency

gx

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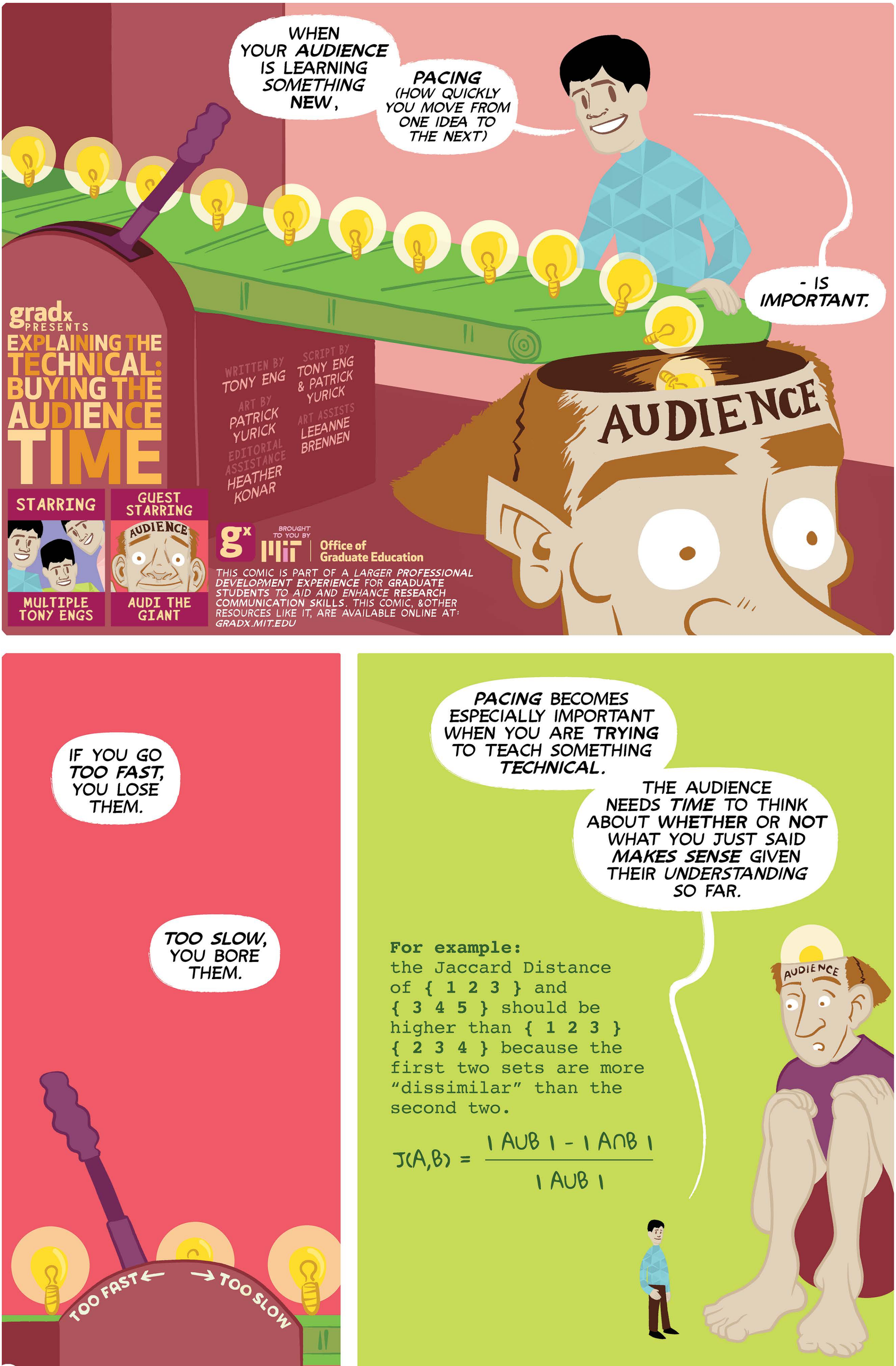
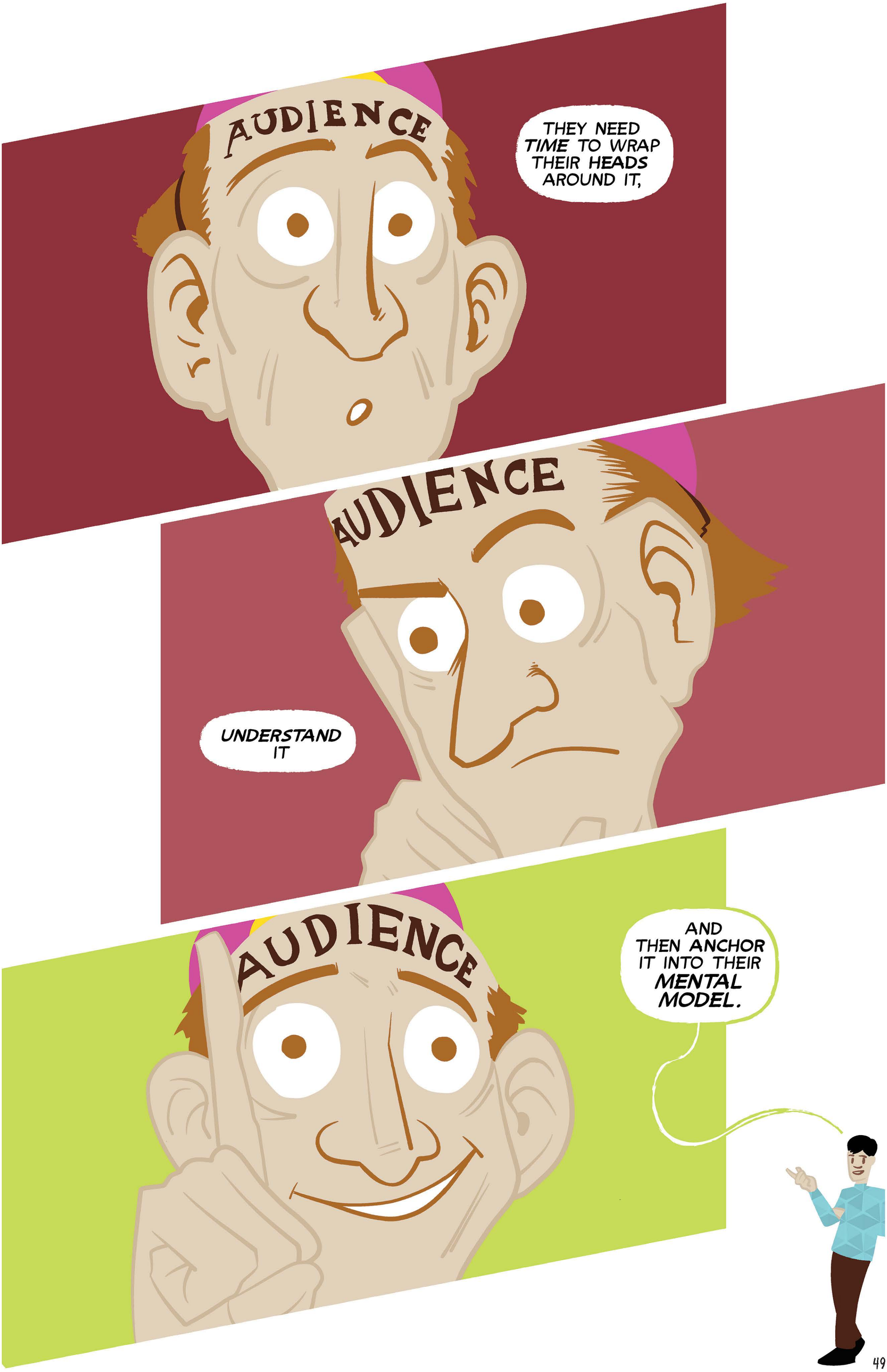
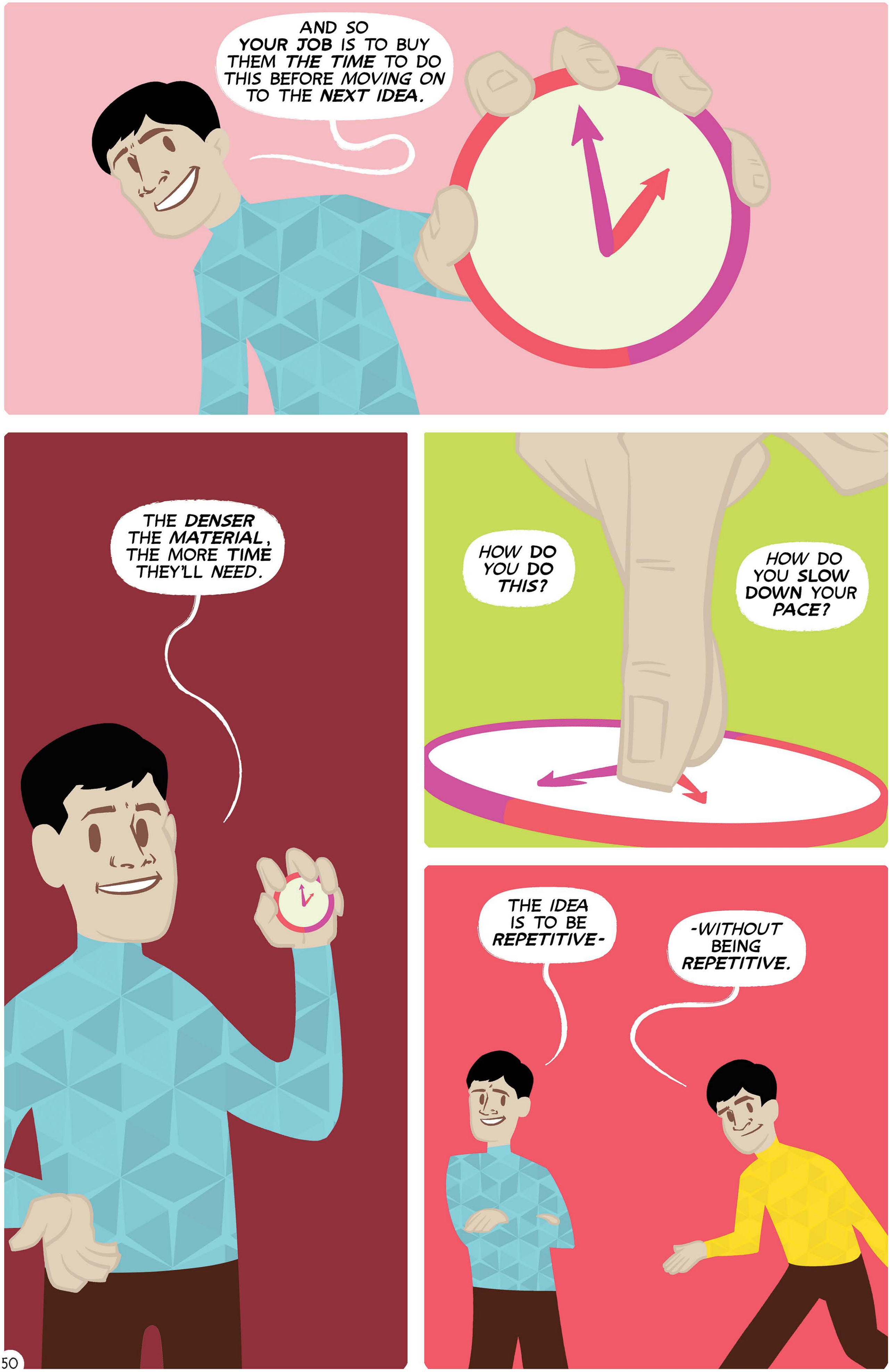
GRADX.MIT.EDU

EXPLAINING THE TECHNICAL

TONY ENG | PATRICK YURICK | LIMITED EDITION

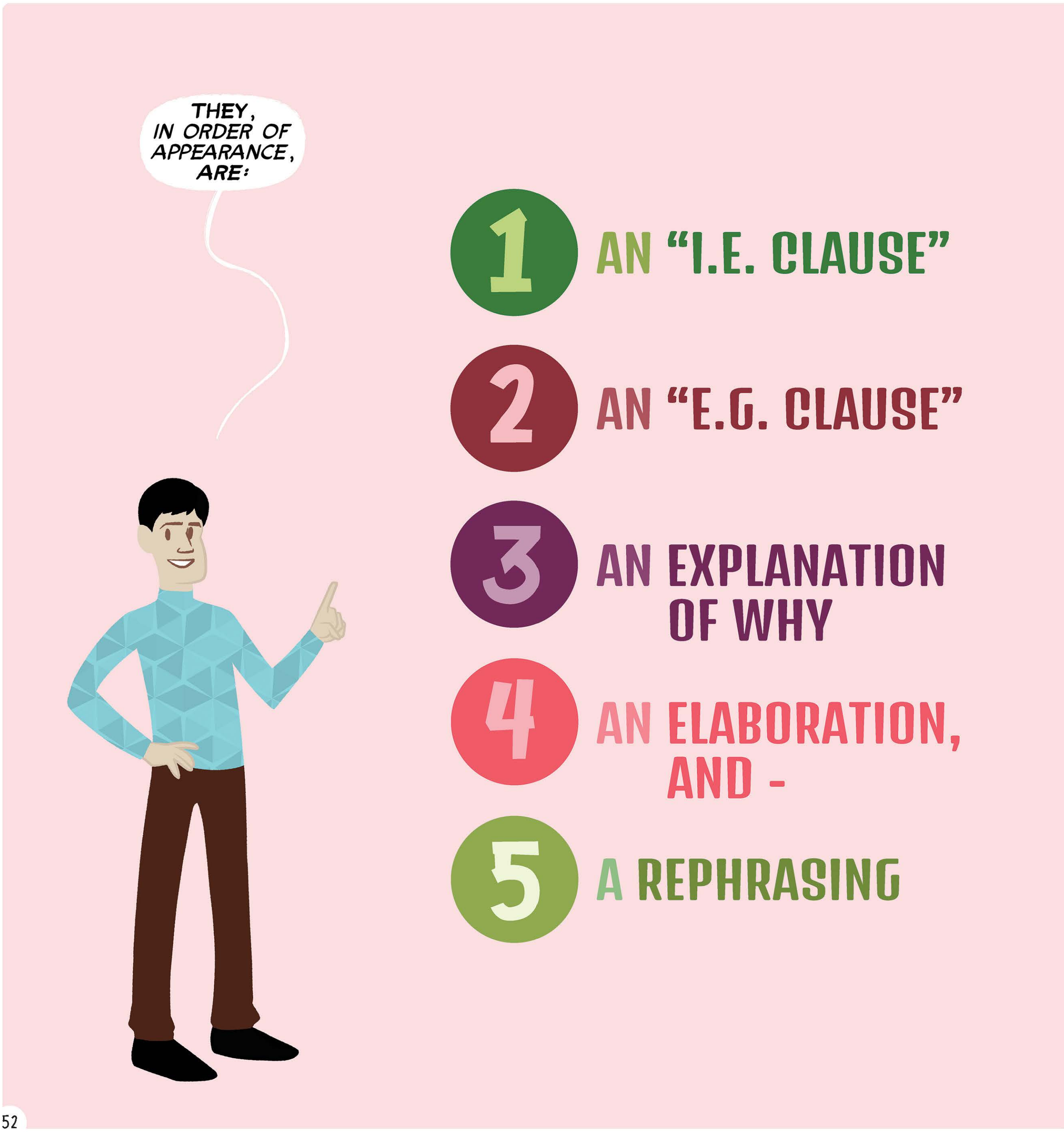

WHEN YOUR AUDIENCE IS LEARNING SOMETHING NEW,
PACING (HOW QUICKLY YOU MOVE FROM ONE IDEA TO THE NEXT)
- IS IMPORTANT.
gradx PRESENTS
EXPLAINING THE TECHNICAL: BUYING THE AUDIENCE TIME
WRITTEN BY TONY ENG
ART BY PATRICK YURICK
EDITORIAL ASSISTANCE HEATHER KONAR
SCRIPT BY TONY ENG & PATRICK YURICK
ART ASSISTS LEEANNE BRENNEN
STARRING MULTIPLE TONY ENGS
GUEST STARRING AUDI THE GIANT
AUDIENCE
BROUGHT TO YOU BY MIT Office of Graduate Education
THIS COMIC IS PART OF A LARGER PROFESSIONAL DEVELOPMENT EXPERIENCE FOR GRADUATE STUDENTS TO AID AND ENHANCE RESEARCH COMMUNICATION SKILLS. THIS COMIC, &OTHER RESOURCES LIKE IT, ARE AVAILABLE ONLINE AT: GRADX.MIT.EDU
IF YOU GO TOO FAST, YOU LOSE THEM.
TOO SLOW, YOU BORE THEM.
TOO FAST ← → TOO SLOW
PACING BECOMES ESPECIALLY IMPORTANT WHEN YOU ARE TRYING TO TEACH SOMETHING TECHNICAL.
THE AUDIENCE NEEDS TIME TO THINK ABOUT WHETHER OR NOT WHAT YOU JUST SAID MAKES SENSE GIVEN THEIR UNDERSTANDING SO FAR.
For example: the Jaccard Distance of { 1 2 3 } and { 3 4 5 } should be higher than { 1 2 3 } { 2 3 4 } because the first two sets are more "dissimilar" than the second two.
J(A,B) = (|A∪B| - |A∩B|) / |A∪B|
AUDIENCE


AUDIENCE
THEY NEED *TIME* TO WRAP THEIR **HEADS** AROUND IT,
AUDIENCE
UNDERSTAND IT
AUDIENCE
AND THEN **ANCHOR** IT INTO THEIR ***MENTAL MODEL.***

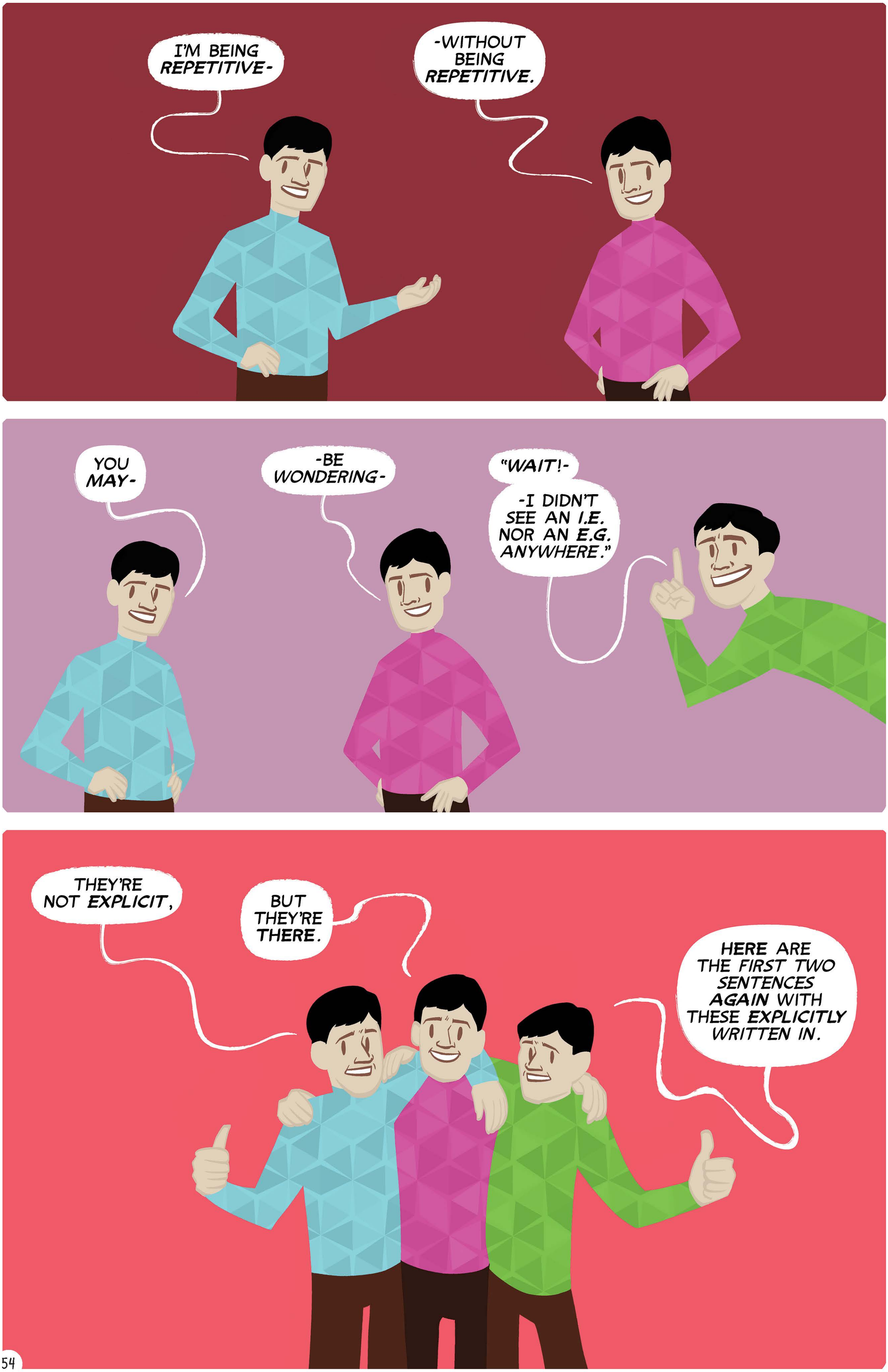

AND SO YOUR **JOB** IS TO BUY THEM ***THE TIME*** TO DO THIS BEFORE *MOVING ON* TO THE ***NEXT IDEA.***
THE ***DENSER*** THE ***MATERIAL***, THE MORE **TIME** THEY'LL *NEED*.
HOW **DO** *YOU* **DO** ***THIS?***
HOW DO YOU ***SLOW*** **DOWN YOUR** ***PACE?***
THE *IDEA* IS TO BE ***REPETITIVE-***
-WITHOUT BEING ***REPETITIVE.***

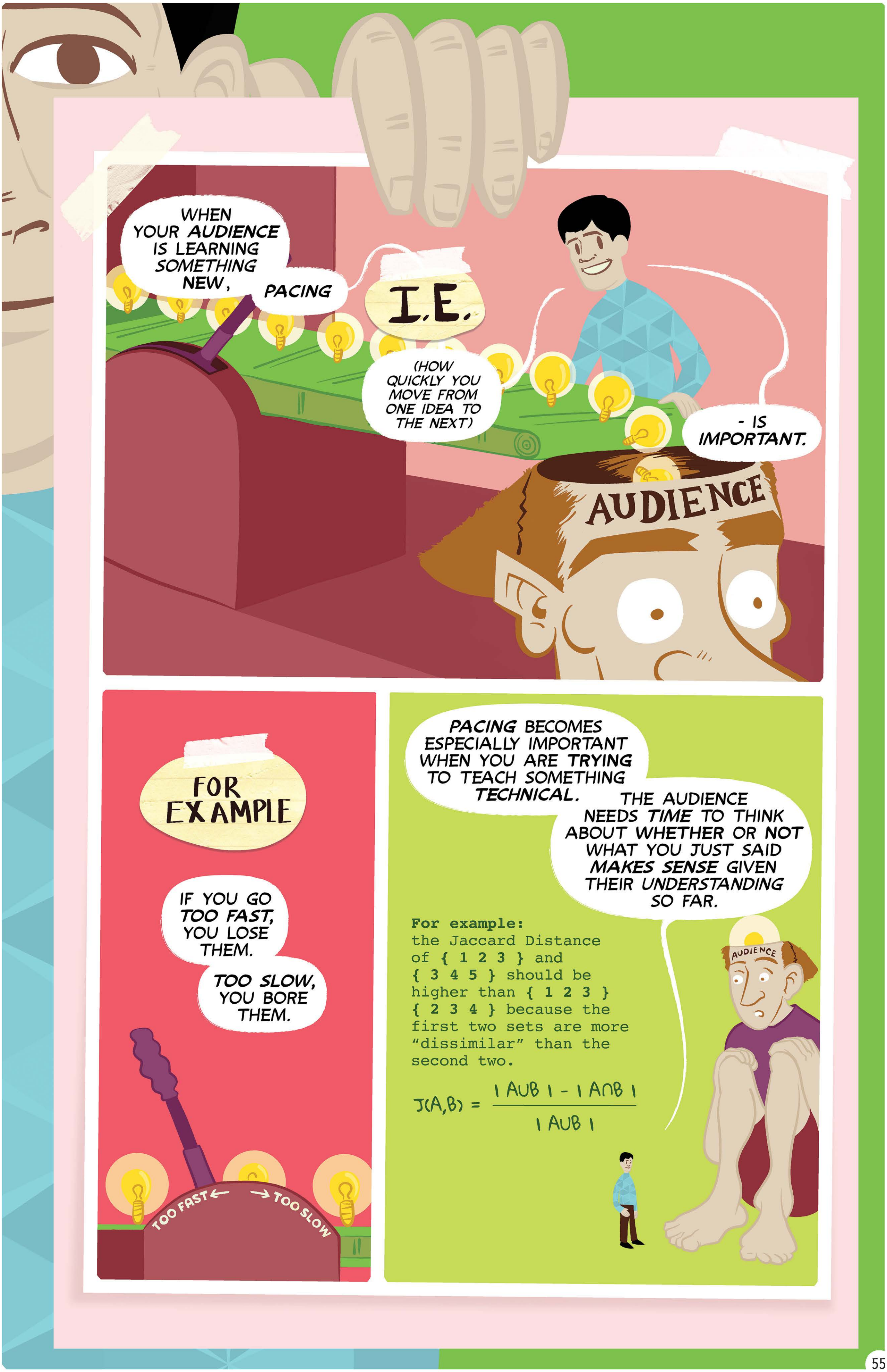

TELL THEM WHAT YOU'VE JUST TOLD THEM BUT IN A DIFFERENT WAY,
SO THAT YOU CAN REINFORCE,
CLARIFY,
AND FILL IN SOME DETAILS ABOUT WHAT YOU JUST SAID.
IN THIS COMIC SO FAR, I'VE ALREADY SHOWN YOU FIVE WAYS TO DO THIS.
REREAD THE START OF THIS COMIC TO SEE IF YOU CAN SPOT THEM.
GO AHEAD,
I'LL WAIT.


DID YOU FIND THEM?


THEY, IN ORDER OF APPEARANCE, ARE:
1 AN "I.E. CLAUSE"
2 AN "E.G. CLAUSE"
3 AN EXPLANATION OF WHY
4 AN ELABORATION, AND -
5 A REPHRASING


ALL I'M DOING IS REITERATING SOMETHING THAT I TOLD YOU BUT, ACTUALLY, IT'S A VARIATION.
SOMETIMES I PROVIDE MORE DETAILS.
DETAILS
SOMETIMES I GIVE YOU AN EXAMPLE.
EXAMPLE
SOMETIMES I GIVE A RATIONALE.
RATIONALE
SOMETIMES I DEFINE WHAT I MEAN.
DEFINE
SOMETIMES I REWORD-
-OR SIMPLY-
REPEAT.
REPEAT
REPHRASE
REWORD


I'M BEING REPETITIVE-
-WITHOUT BEING REPETITIVE.
YOU MAY-
-BE WONDERING-
"WAIT!-
-I DIDN'T SEE AN I.E. NOR AN E.G. ANYWHERE."
THEY'RE NOT EXPLICIT,
BUT THEY'RE THERE.
HERE ARE THE FIRST TWO SENTENCES AGAIN WITH THESE EXPLICITLY WRITTEN IN.



WHEN YOUR AUDIENCE IS LEARNING SOMETHING NEW,
PACING
I.E.
(HOW QUICKLY YOU MOVE FROM ONE IDEA TO THE NEXT)
- IS IMPORTANT.
AUDIENCE
FOR EXAMPLE
IF YOU GO TOO FAST, YOU LOSE THEM.
TOO SLOW, YOU BORE THEM.
TOO FAST
TOO SLOW
PACING BECOMES ESPECIALLY IMPORTANT WHEN YOU ARE TRYING TO TEACH SOMETHING TECHNICAL.
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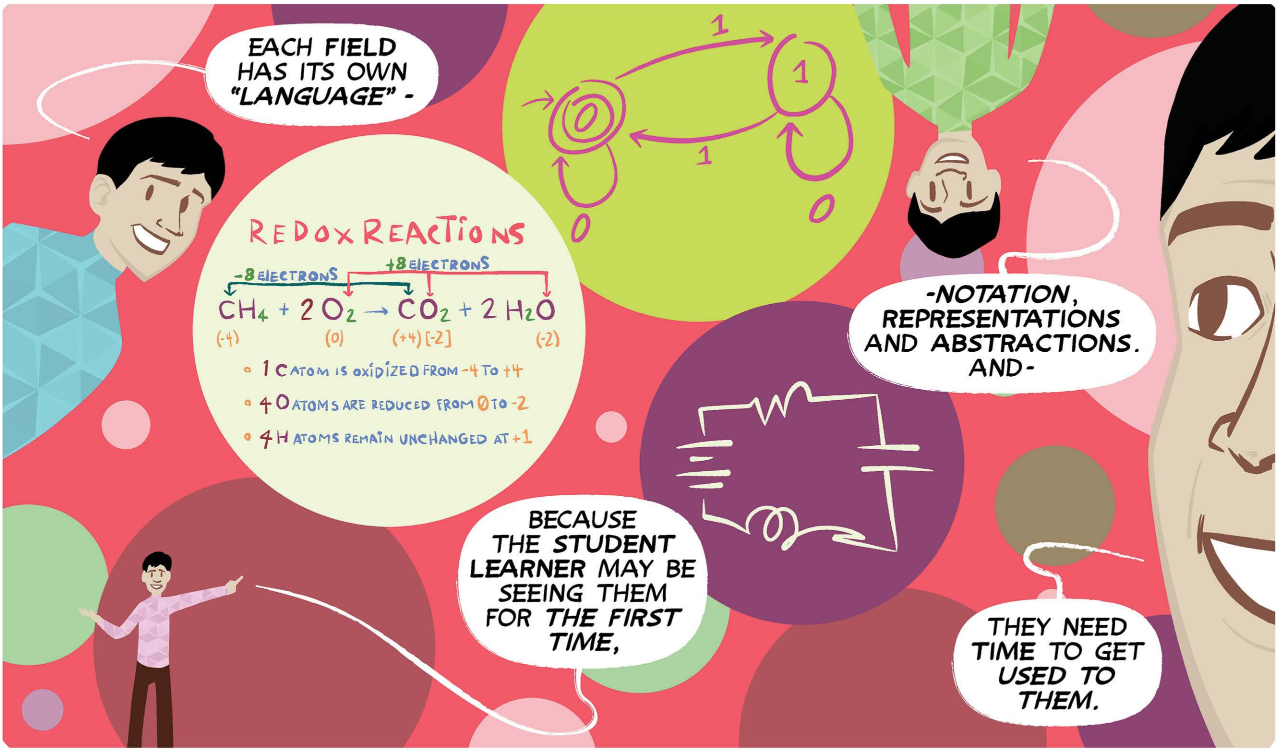
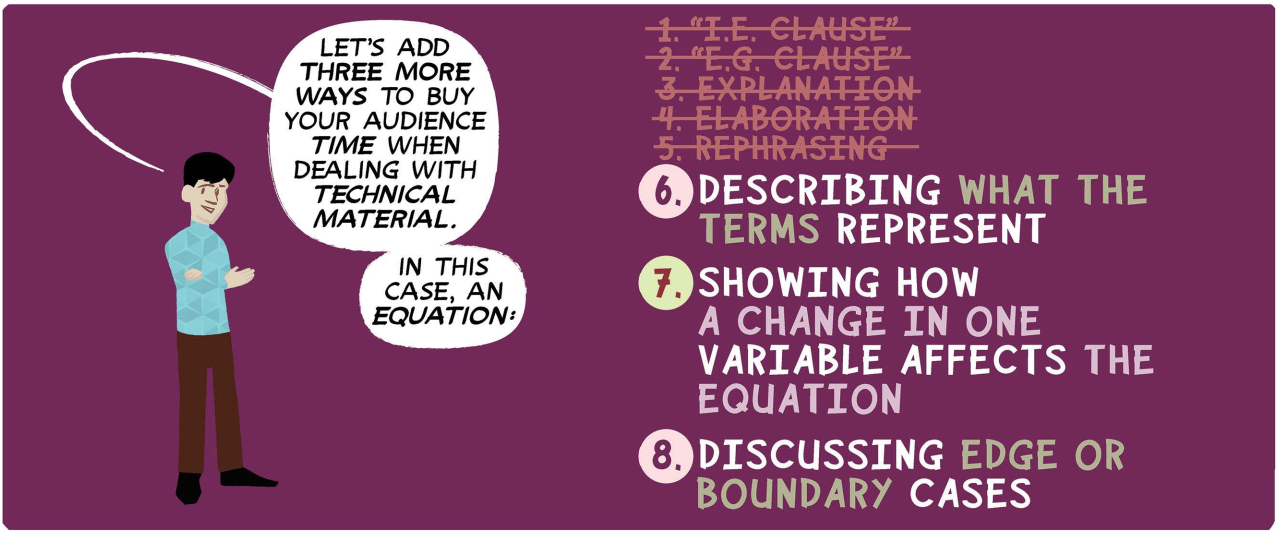
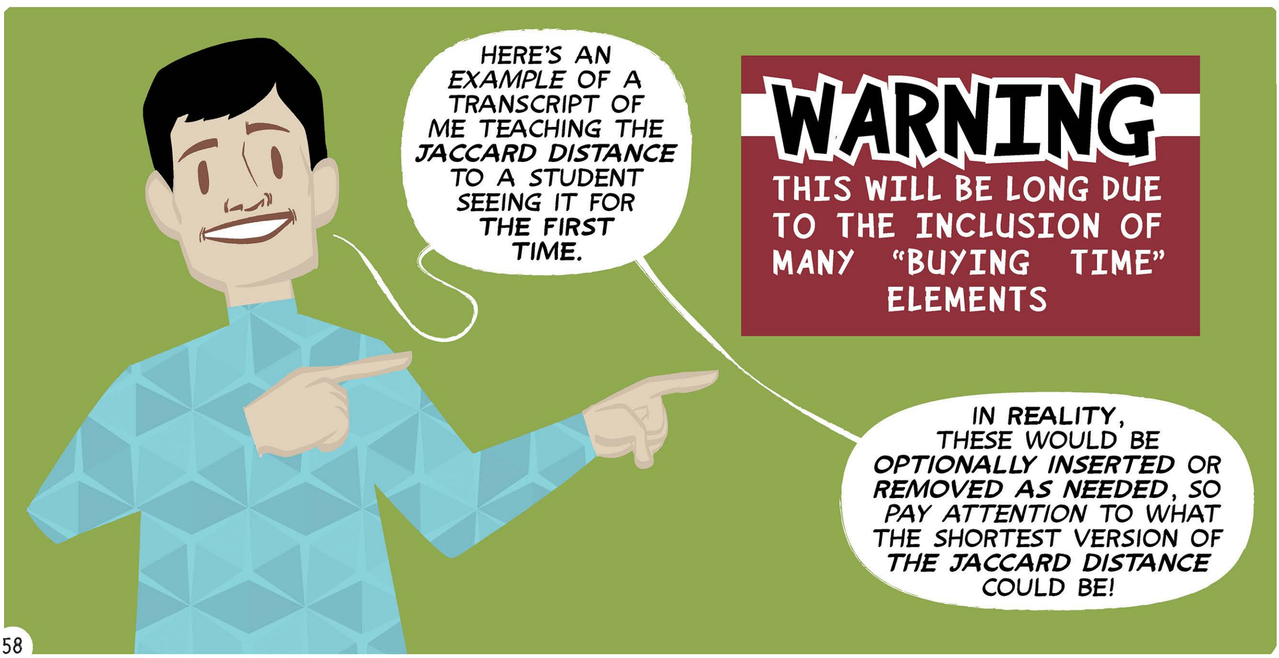
For example: the Jaccard Distance of { 1 2 3 } and { 3 4 5 } should be higher than { 1 2 3 } { 2 3 4 } because the first two sets are more "dissimilar" than the second two.
$J(A,B) = \frac{|A \cup B| - |A \cap B|}{|A \cup B|}$
AUDIENCE

HERE ARE EXAMPLES OF THE REMAINING THREE:
EXPLANATION OF WHY
THE AUDIENCE NEEDS TIME TO THINK ABOUT WHETHER OR NOT WHAT YOU JUST SAID MAKES SENSE GIVEN THEIR UNDERSTANDING SO FAR.
AUDIENCE
THEY NEED TIME TO WRAP THEIR HEAD'S AROUND IT,
UNDERSTAND IT
AND THEN ANCHOR IT INTO THEIR MENTAL MODEL.
ELABORATION
REPHRASING
HOW DO YOU DO THIS?
HOW DO YOU SLOW DOWN YOUR PACE?


EVEN THOUGH I'VE USED THEM HERE IN A NON-TECHNICAL EXAMPLE,
THEY CAN ALSO BE USED IN TECHNICAL MATERIAL.
WAIT...
DID SHE JUST SAY SECOND POWER?
...THEN WE RAISE THE RESULT TO THE SECOND POWER
MOMENTS LIKE THESE PROVIDE OPPORTUNITIES TO REPEAT WHAT YOU SAID DIFFERENTLY-
- WHICH ALLOWS LEARNERS TO DOUBLE-CHECK THEIR UNDER-STANDING
YES, SHE DID. OK
THE REASON WE SQUARE THE DIFFERENCE IS SO THAT WE CAN...
BUT, THERE ARE ADDITIONAL CHALLENGES WHEN EXPLAINING TECHNICAL MATERIAL.


EACH FIELD HAS ITS OWN "LANGUAGE" -
REDOX REACTIONS
-8 ELECTRONS
+8 ELECTRONS
CH4 + 2 O2 → CO2 + 2 H2O
(-4) (0) (+4) (-2) (-2)
1 C ATOM IS OXIDIZED FROM -4 TO +4
4 O ATOMS ARE REDUCED FROM 0 TO -2
4 H ATOMS REMAIN UNCHANGED AT +1
1
1
1
0
0
0
-NOTATION, REPRESENTATIONS AND ABSTRACTIONS. AND-
BECAUSE THE STUDENT LEARNER MAY BE SEEING THEM FOR THE FIRST TIME,
THEY NEED TIME TO GET USED TO THEM.


LET'S ADD THREE MORE WAYS TO BUY YOUR AUDIENCE TIME WHEN DEALING WITH TECHNICAL MATERIAL.
IN THIS CASE, AN EQUATION:
~~1. "I.E. CLAUSE"~~
~~2. "E.G. CLAUSE"~~
~~3. EXPLANATION~~
~~4. ELABORATION~~
~~5. REPHRASING~~
6. DESCRIBING WHAT THE TERMS REPRESENT
7. SHOWING HOW A CHANGE IN ONE VARIABLE AFFECTS THE EQUATION
8. DISCUSSING EDGE OR BOUNDARY CASES


HERE'S AN EXAMPLE OF A TRANSCRIPT OF ME TEACHING THE JACCARD DISTANCE TO A STUDENT SEEING IT FOR THE FIRST TIME.
WARNING
THIS WILL BE LONG DUE TO THE INCLUSION OF MANY "BUYING TIME" ELEMENTS
IN REALITY, THESE WOULD BE OPTIONALLY INSERTED OR REMOVED AS NEEDED, SO PAY ATTENTION TO WHAT THE SHORTEST VERSION OF THE JACCARD DISTANCE COULD BE!

Introduction to Jaccard Distance

Let's consider the Jaccard Distance.

It's a measure of how "dissimilar" two sets are, the more dissimilar the larger the Jaccard Distance.

For example, the Jaccard Distance of { 1 2 3 } and { 3 4 5 } should be higher than { 1 2 3 } { 2 3 4 } because the first two sets are more "dissimilar" than the second two.

This distance metric is given by the following formula:

$$J(A,B) = \frac{|A \cup B| - |A \cap B|}{|A \cup B|} =$$

The numerator is the number of elements that are a member of either A or B, but not both.

And the denominator is the total number of elements in A when combined with B.

So the Jaccard Distance is essentially the fraction of elements that are not common to both sets.

For the examples above, the Jaccard Distances are 4/5 and 2/4 respectively.

Note that if A equals B, then there are no elements that are not common to both, so the Jaccard Distance is 0 - i.e. the sets are not dissimilar.

KEY

The shortest version of the explanation with all "buying time" elements removed

1. — an "i.e. clause"
2. — an "e.g. clause"
3. — an explanation of why
4. — an elaboration, and
5. — a rephrasing.
6. — describing what the terms represent
7. — showing how a change in one variable affects the equation, &
8. — discussing edge or boundary cases.

As the number of elements that are not common to both sets increases, meaning the sets get more and more dissimilar, the Jaccard Distance increases from zero.

It reaches its maximum value of 1 when the sets are disjoint - when none of the elements of A overlap with those of B, so every member of A and every member of B are counted in the numerator.

And lastly, if one set is contained within the other, without loss of generality, assume A is a subset of B, then the Jaccard Distance becomes the fraction of elements that are in B, the larger set, that are not in A.

I.E.

$J(A,B) =$


SO YOU MIGHT BE WONDERING
- HOW MUCH TIME DO YOU HAVE TO BUY YOUR AUDIENCE?
TWO THOUGHTS.
FIRST-
- IF YOU ARE DOING THIS LIVE,
THEN YOU CAN EITHER ASK AND/OR READ YOUR AUDIENCE
AND THEN ADJUST AS YOU GO..


SO FOR EXAMPLE, IF I THINK MY AUDIENCE GETS IT, THEN INSTEAD OF EXPLAINING THE FINAL EDGE CASE IN THE JACCARD EXAMPLE,
I COULD LEAVE IT OUT -
-OR EVEN BETTER,
I COULD TEST THEIR UNDERSTANDING BY ASKING THEM WHAT WOULD HAPPEN WITH THE EDGE CASE.
SECOND-
- WITH EXPERIENCE
YOU'LL KNOW.


ONCE YOU'VE TRIED TO EXPLAIN THE SAME THING SEVERAL TIMES TO DIFFERENT AUDIENCES,
YOU'LL HAVE A GOOD FEEL FOR WHICH PARTS OF YOUR EXPLANATION-
-TENDS TO CONFUSE AN AUDIENCE.
AUDIENCE
YOU'LL KNOW WHEN
WHERE
AND HOW
AUDIENCE
YOU'LL NEED TO BUY THEM TIME.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CONTROLLING FOCUS
EXPLAINING WHILE EXPLORING

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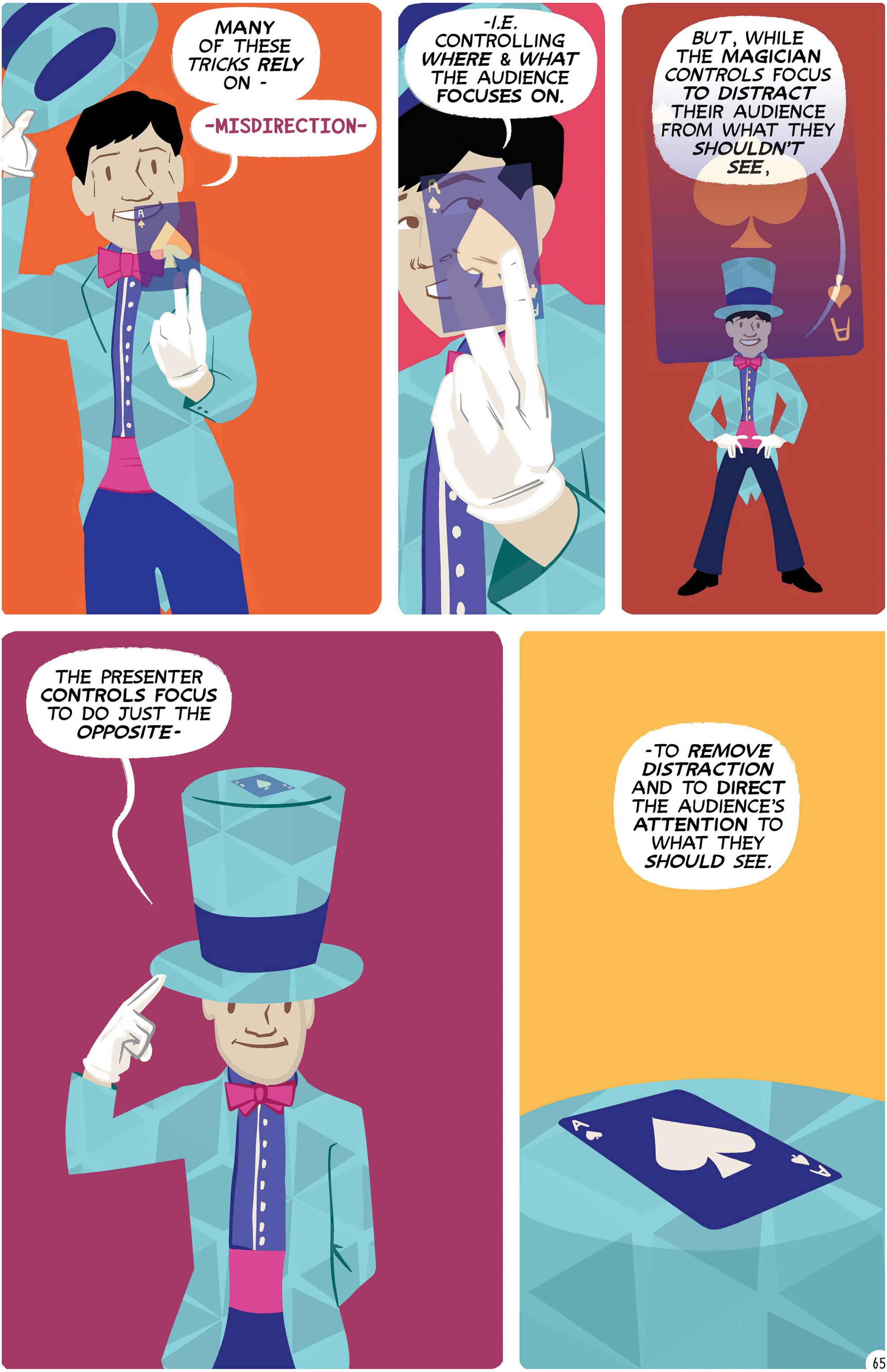
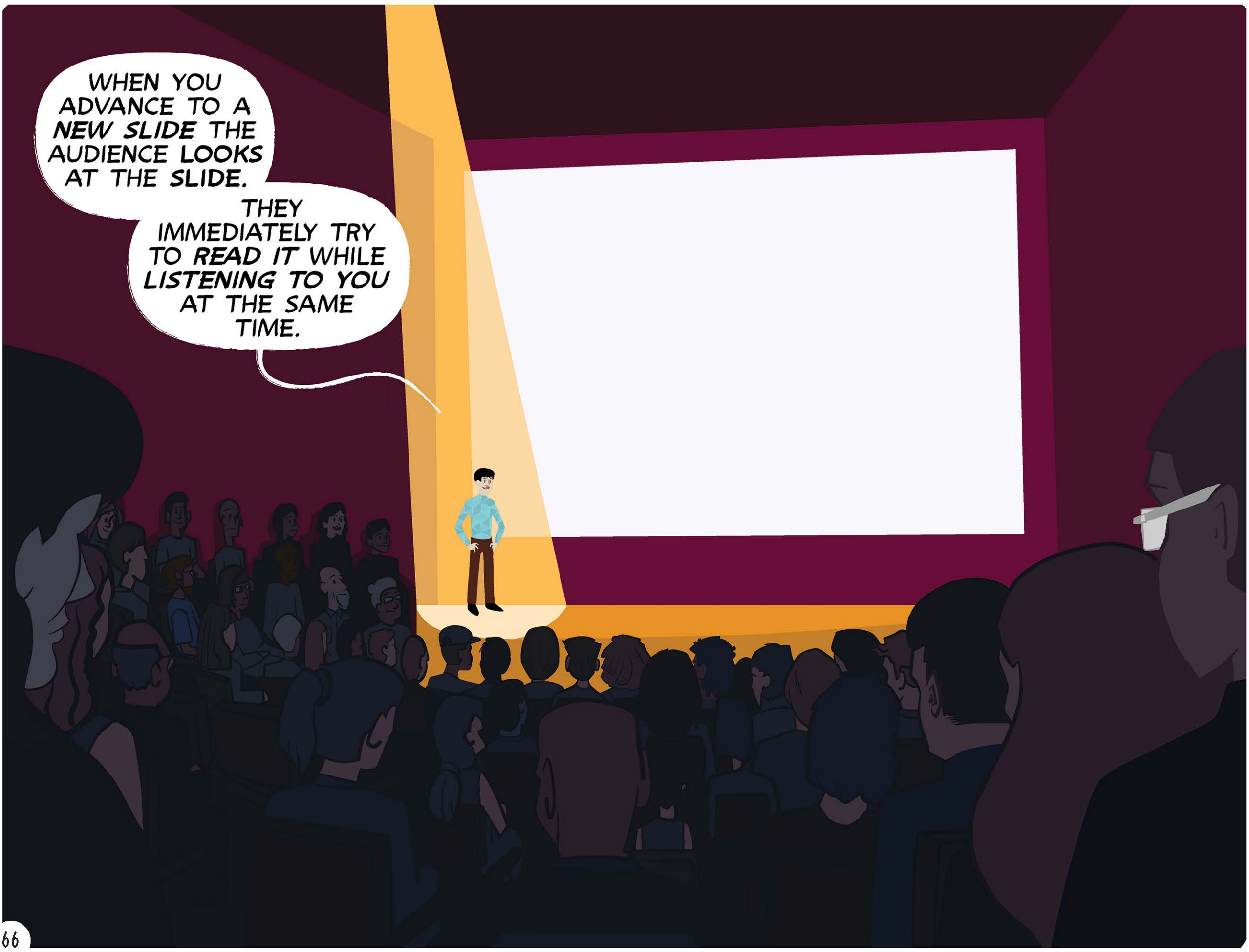
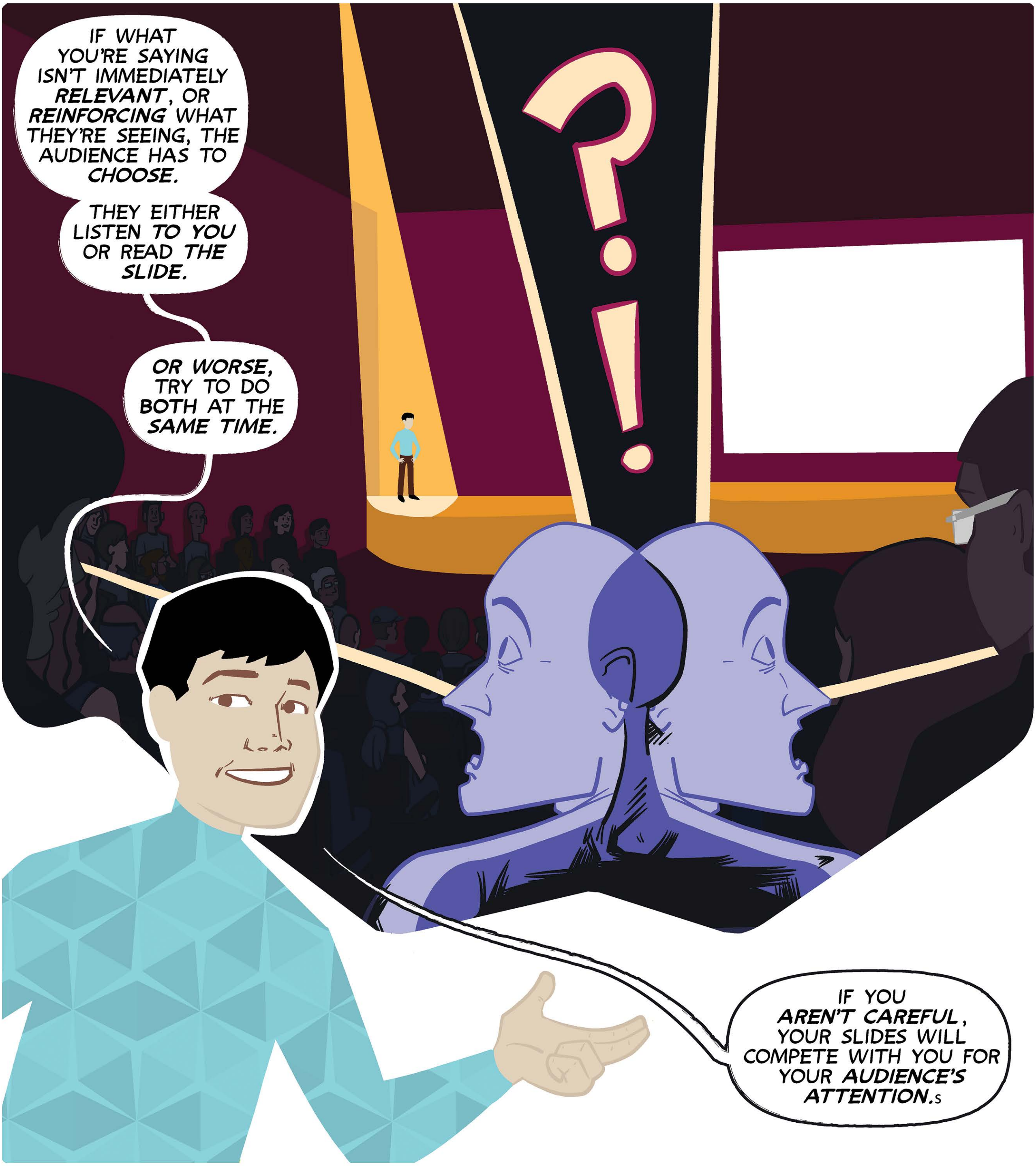
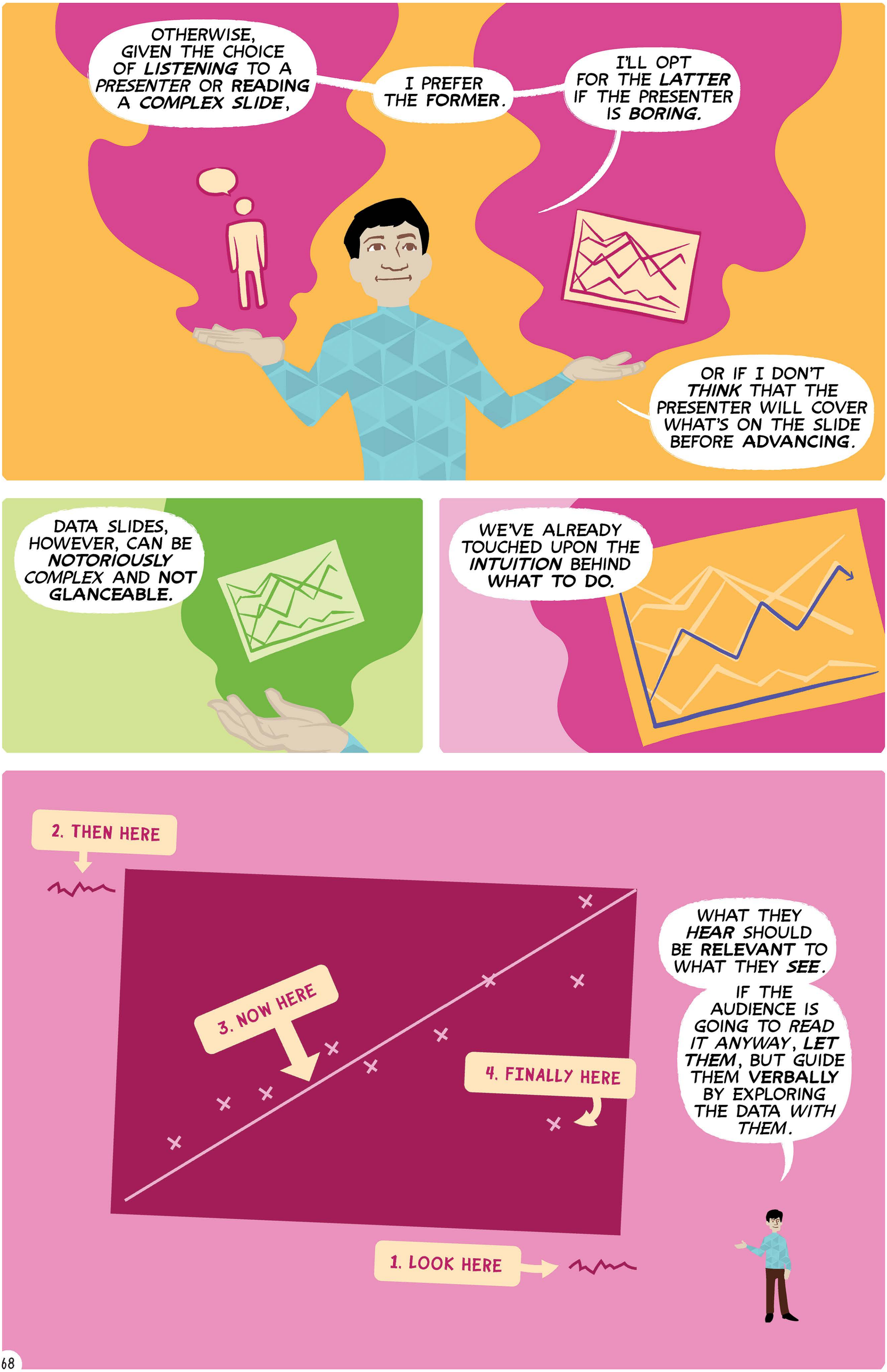

MANY OF THESE TRICKS RELY ON -
-MISDIRECTION-
-I.E. CONTROLLING WHERE & WHAT THE AUDIENCE FOCUSES ON.
BUT, WHILE THE MAGICIAN CONTROLS FOCUS TO DISTRACT THEIR AUDIENCE FROM WHAT THEY SHOULDN'T SEE,
THE PRESENTER CONTROLS FOCUS TO DO JUST THE OPPOSITE-
-TO REMOVE DISTRACTION AND TO DIRECT THE AUDIENCE'S ATTENTION TO WHAT THEY SHOULD SEE.


HOWEVER, MOST PRESENTERS USE SLIDES, AND IF NOT USED APPROPRIATELY, SLIDES CAN BECOME A DISTRACTION.

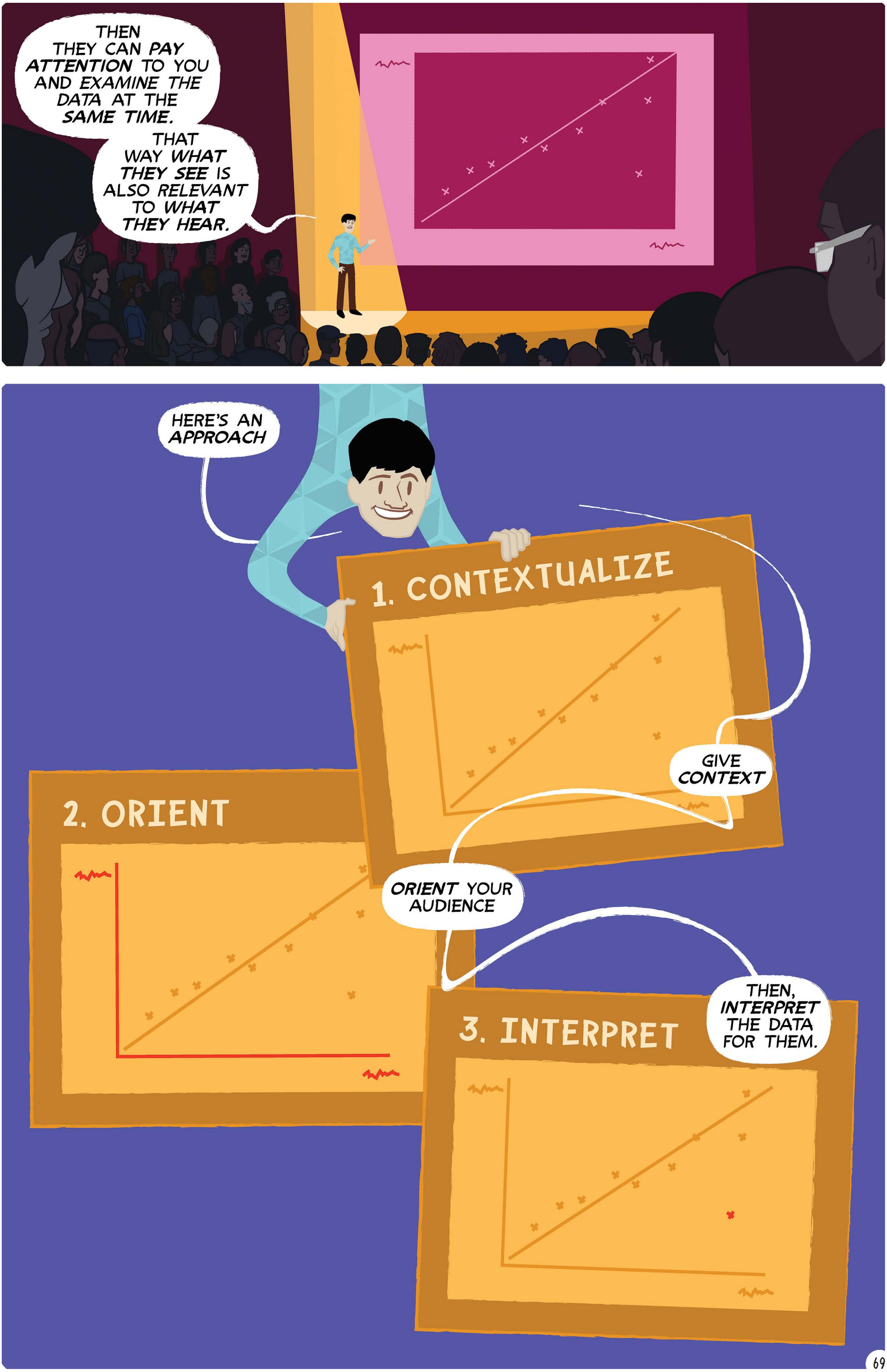

WHEN YOU ADVANCE TO A NEW SLIDE THE AUDIENCE LOOKS AT THE SLIDE.
THEY IMMEDIATELY TRY TO READ IT WHILE LISTENING TO YOU AT THE SAME TIME.

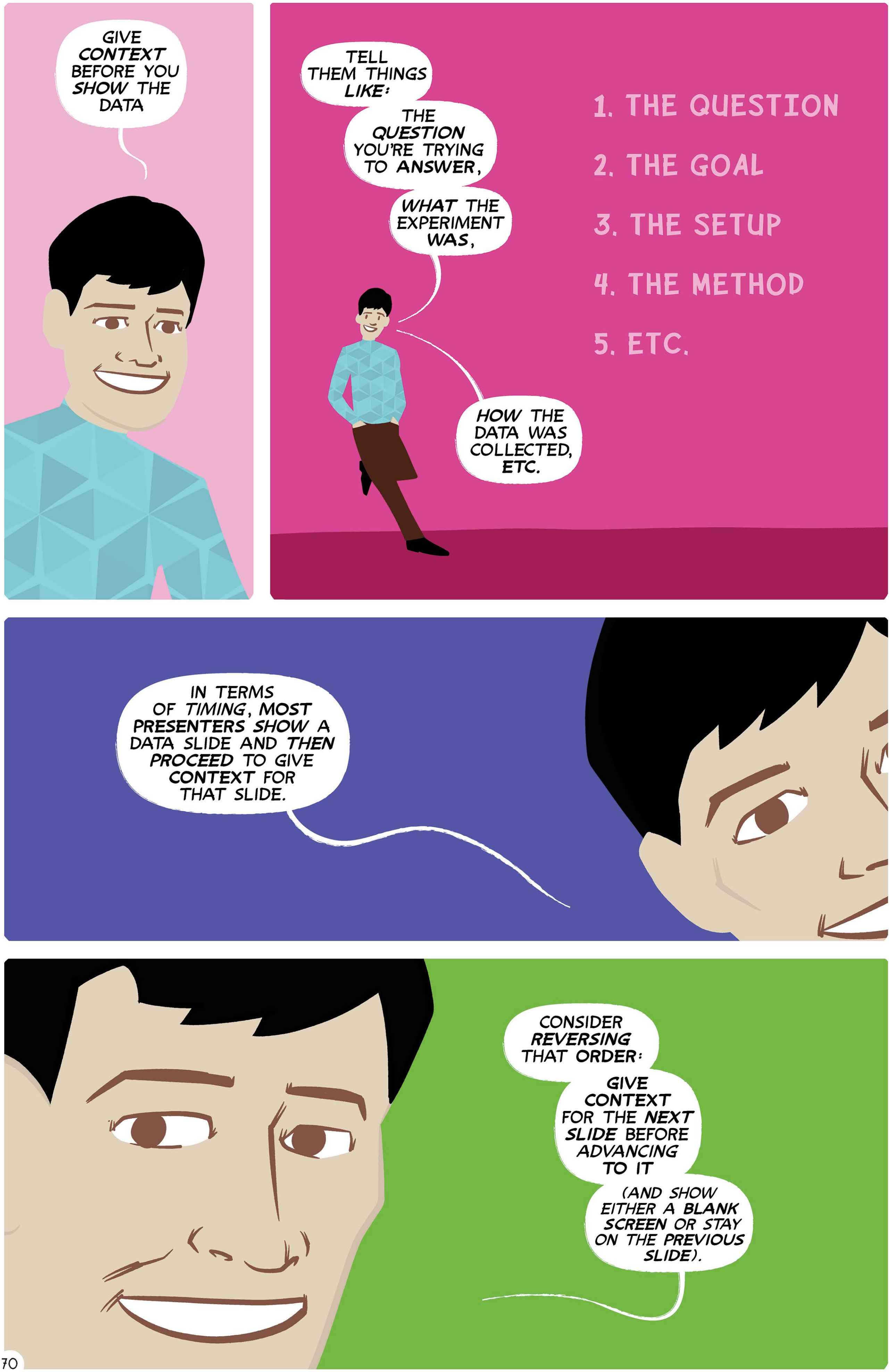

IF WHAT YOU'RE SAYING ISN'T IMMEDIATELY **RELEVANT**, OR **REINFORCING** WHAT THEY'RE SEEING, THE AUDIENCE HAS TO **CHOOSE.**
THEY EITHER LISTEN **TO YOU** OR READ **THE SLIDE.**
OR WORSE, TRY TO DO BOTH AT THE **SAME TIME.**
IF YOU **AREN'T CAREFUL**, YOUR SLIDES WILL COMPETE WITH YOU FOR YOUR **AUDIENCE'S ATTENTION.**s

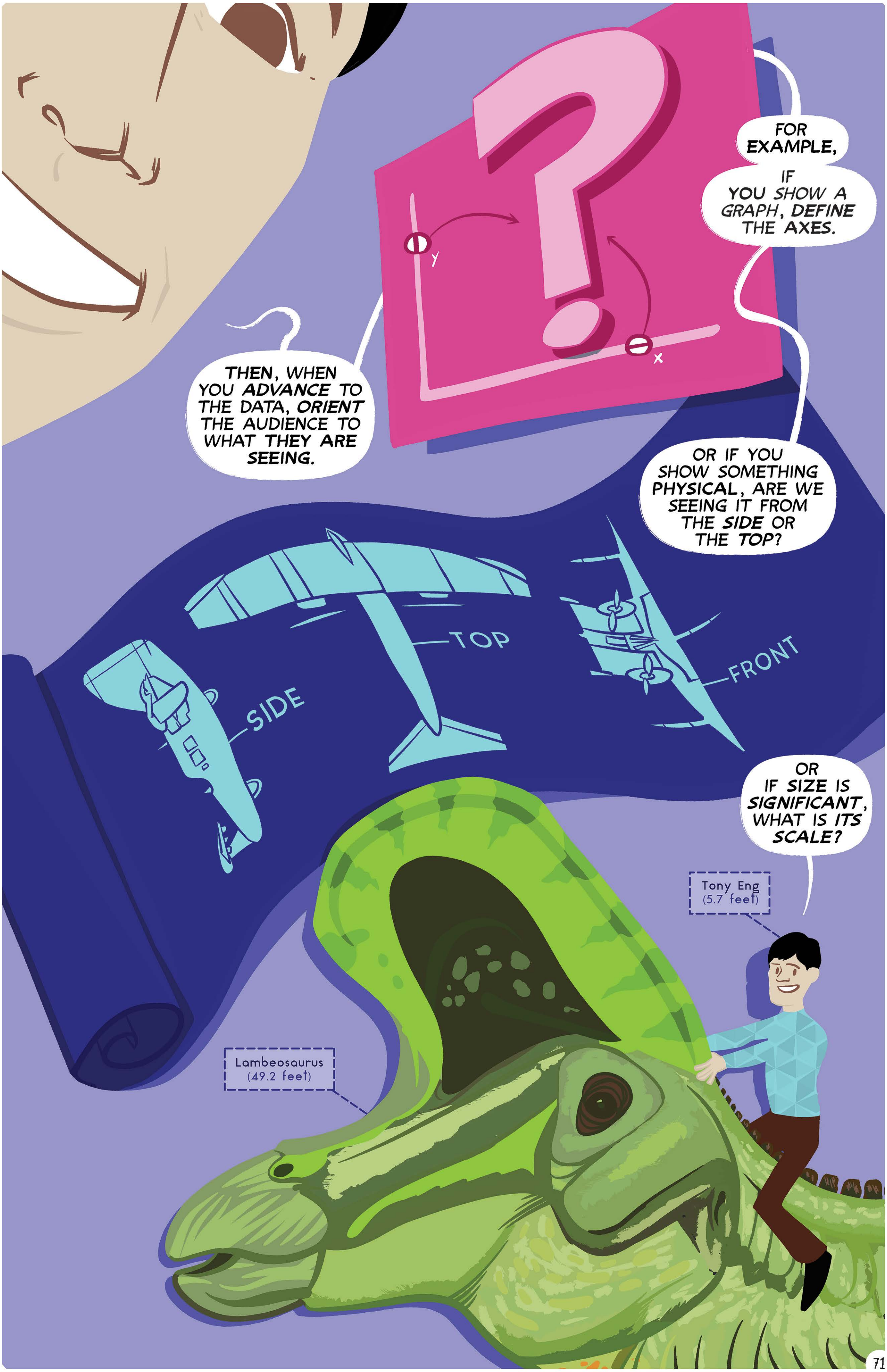

TO KEEP SLIDES FROM **COMPETING** WITH **YOU** FOR YOUR **AUDIENCE'S ATTENTION**, TRY TO KEEP SLIDES **"GLANCEABLE".**
THAT WAY, AN AUDIENCE CAN **GLANCE** AT THE **NEW INFORMATION** ON A **SLIDE** AND THEN *FOCUS* THEIR *ATTENTION* BACK ON **YOU**.

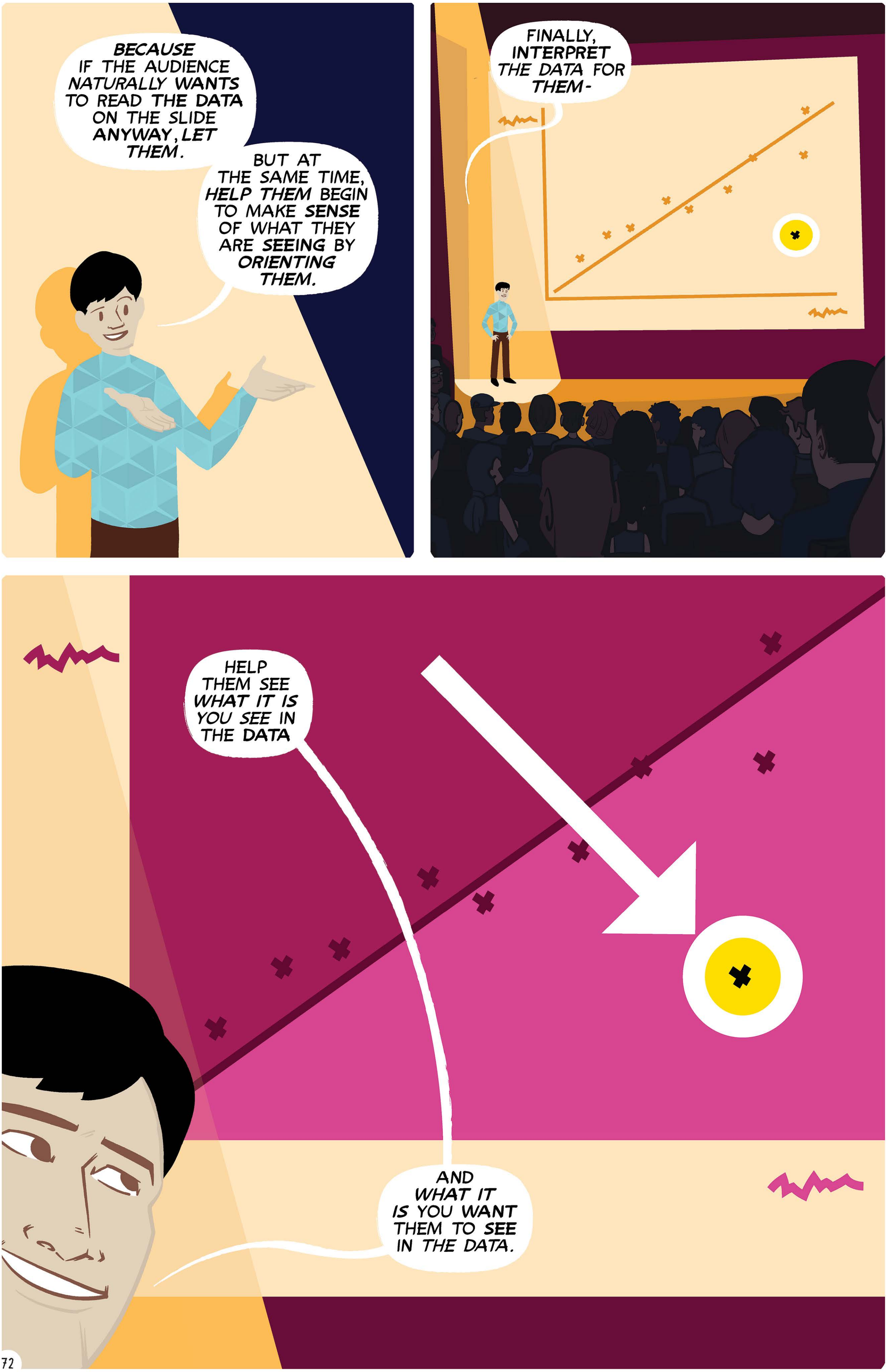


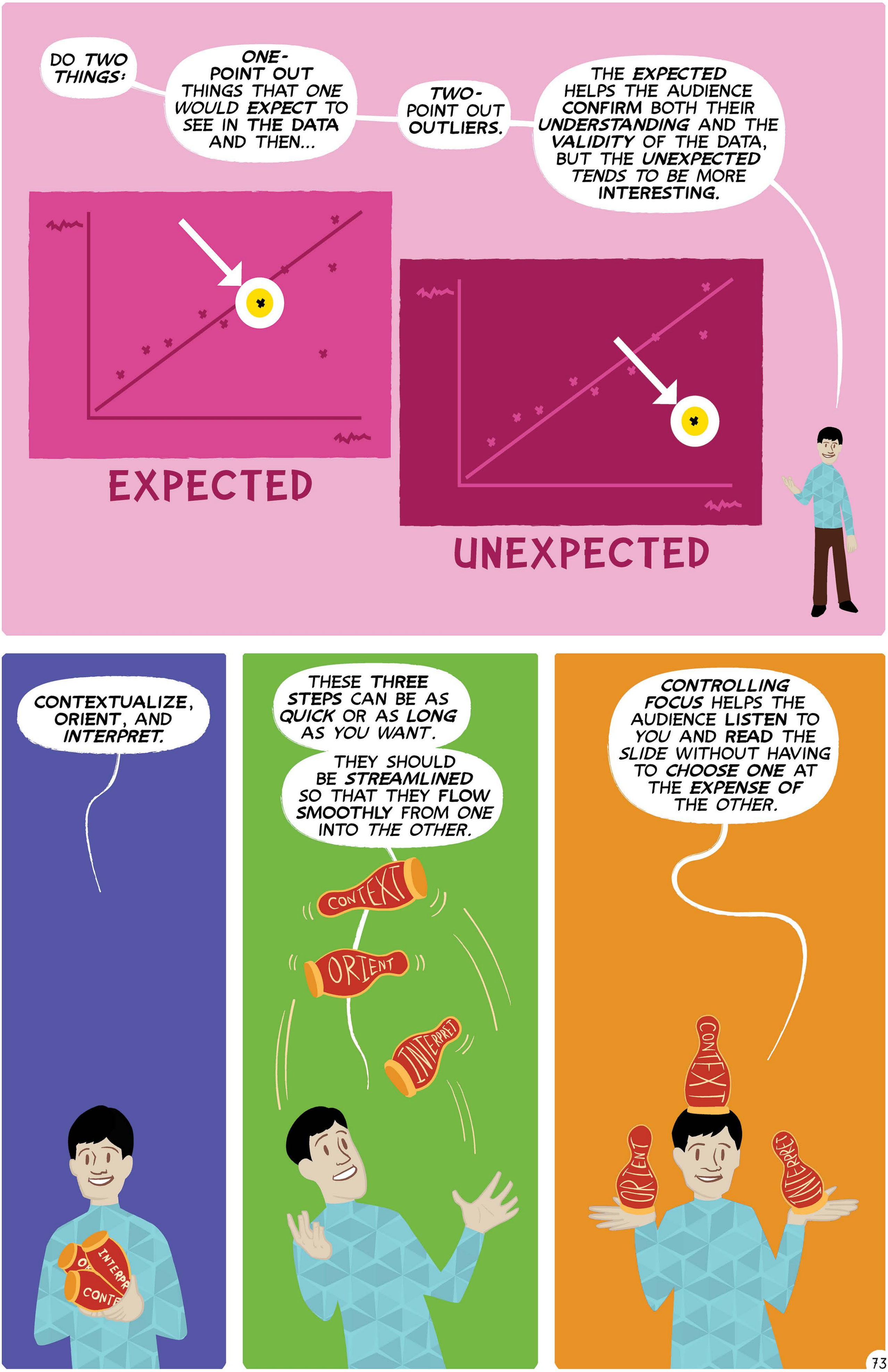
OTHERWISE, GIVEN THE CHOICE OF LISTENING TO A PRESENTER OR READING A COMPLEX SLIDE,
I PREFER THE FORMER.
I'LL OPT FOR THE LATTER IF THE PRESENTER IS BORING.
OR IF I DON'T THINK THAT THE PRESENTER WILL COVER WHAT'S ON THE SLIDE BEFORE ADVANCING.
DATA SLIDES, HOWEVER, CAN BE NOTORIOUSLY COMPLEX AND NOT GLANCEABLE.
WE'VE ALREADY TOUCHED UPON THE INTUITION BEHIND WHAT TO DO.
2. THEN HERE
3. NOW HERE
4. FINALLY HERE
1. LOOK HERE
WHAT THEY HEAR SHOULD BE RELEVANT TO WHAT THEY SEE.
IF THE AUDIENCE IS GOING TO READ IT ANYWAY, LET THEM, BUT GUIDE THEM VERBALLY BY EXPLORING THE DATA WITH THEM.

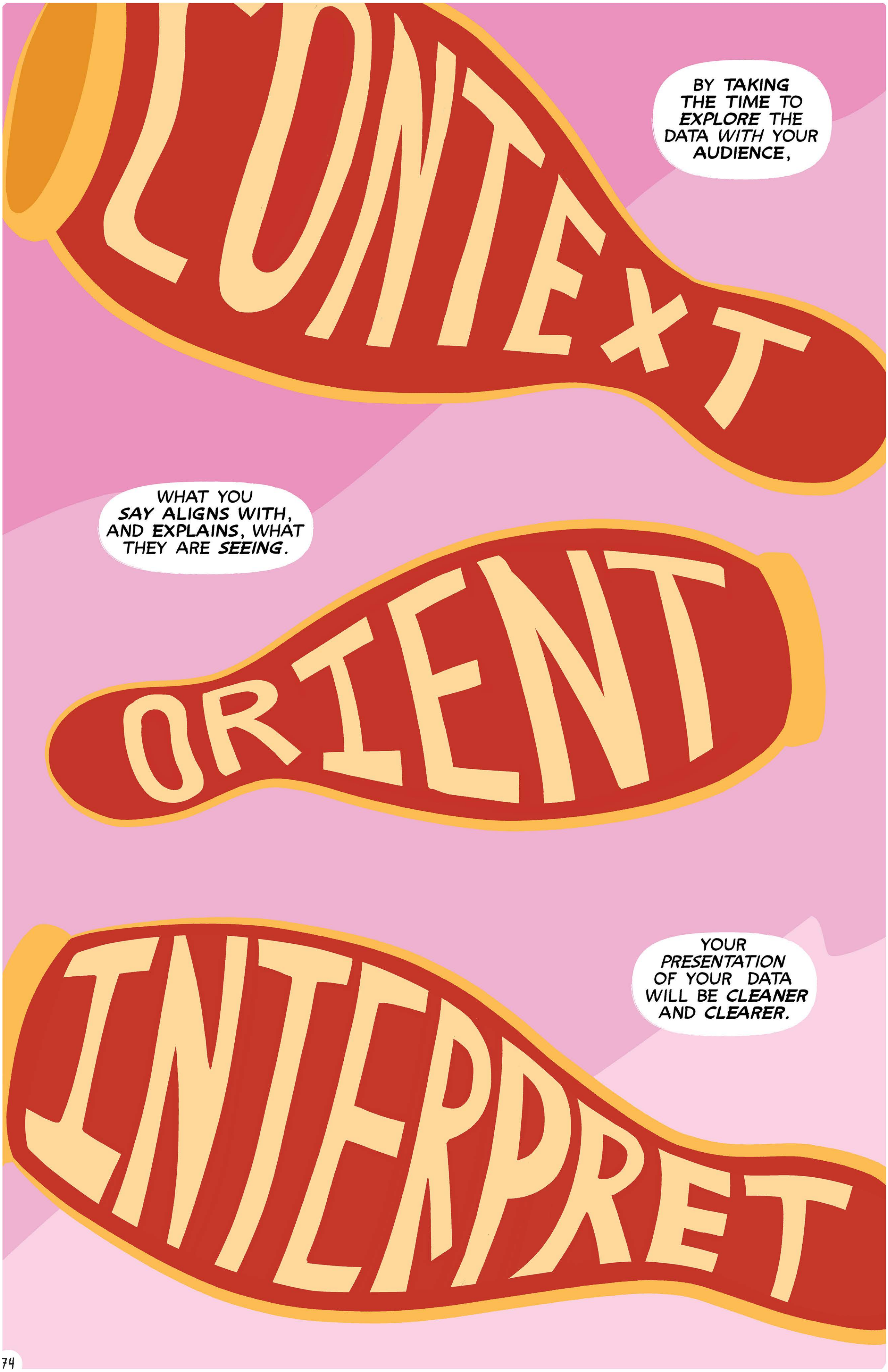

THEN THEY CAN PAY ATTENTION TO YOU AND EXAMINE THE DATA AT THE SAME TIME.
THAT WAY WHAT THEY SEE IS ALSO RELEVANT TO WHAT THEY HEAR.
HERE'S AN APPROACH
1. CONTEXTUALIZE
GIVE CONTEXT
2. ORIENT
ORIENT YOUR AUDIENCE
3. INTERPRET
THEN, INTERPRET THE DATA FOR THEM.

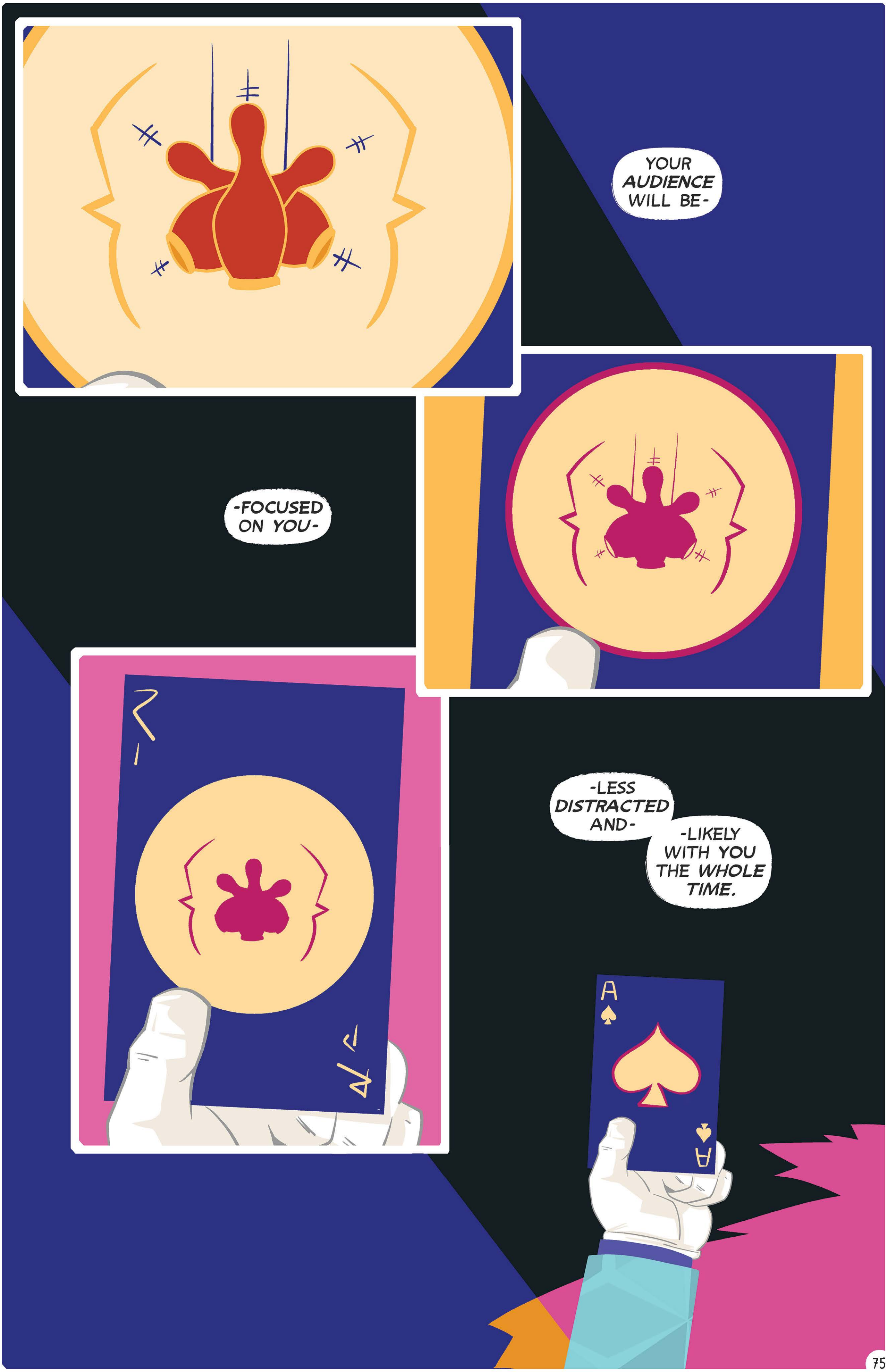

GIVE CONTEXT BEFORE YOU SHOW THE DATA
TELL THEM THINGS LIKE:
THE QUESTION YOU'RE TRYING TO ANSWER,
WHAT THE EXPERIMENT WAS,
HOW THE DATA WAS COLLECTED, ETC.
1. THE QUESTION
2. THE GOAL
3. THE SETUP
4. THE METHOD
5. ETC.
IN TERMS OF TIMING, MOST PRESENTERS SHOW A DATA SLIDE AND THEN PROCEED TO GIVE CONTEXT FOR THAT SLIDE.
CONSIDER REVERSING THAT ORDER:
GIVE CONTEXT FOR THE NEXT SLIDE BEFORE ADVANCING TO IT
(AND SHOW EITHER A BLANK SCREEN OR STAY ON THE PREVIOUS SLIDE).


THEN, WHEN YOU ADVANCE TO THE DATA, ORIENT THE AUDIENCE TO WHAT THEY ARE SEEING.
FOR EXAMPLE,
IF YOU SHOW A GRAPH, DEFINE THE AXES.
y
x
OR IF YOU SHOW SOMETHING PHYSICAL, ARE WE SEEING IT FROM THE SIDE OR THE TOP?
SIDE
TOP
FRONT
OR IF SIZE IS SIGNIFICANT, WHAT IS ITS SCALE?
Tony Eng
(5.7 feet)
Lambeosaurus
(49.2 feet)

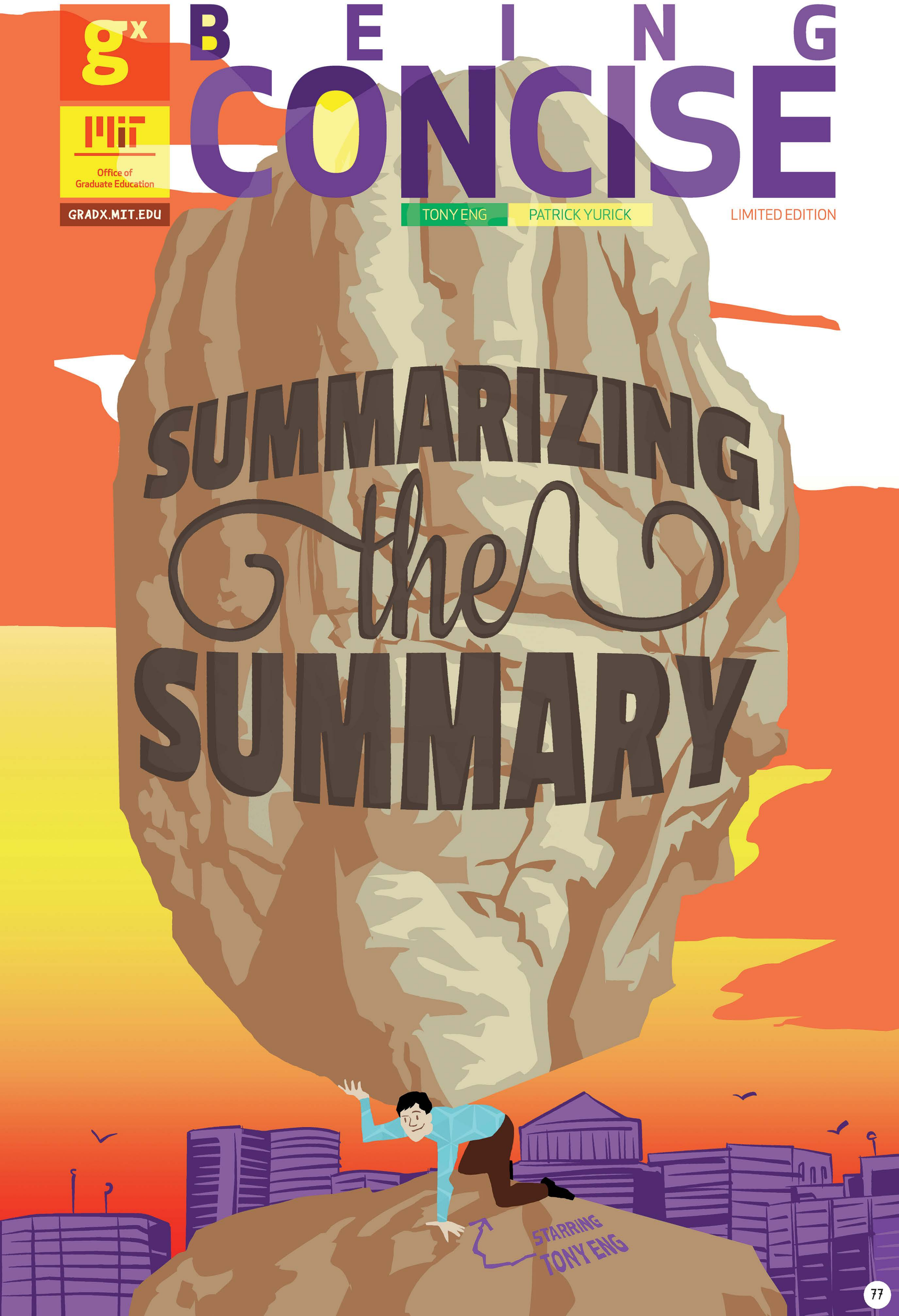

BECAUSE IF THE AUDIENCE NATURALLY WANTS TO READ THE DATA ON THE SLIDE ANYWAY, LET THEM.
BUT AT THE SAME TIME, HELP THEM BEGIN TO MAKE SENSE OF WHAT THEY ARE SEEING BY ORIENTING THEM.
FINALLY, INTERPRET THE DATA FOR THEM-
HELP THEM SEE WHAT IT IS YOU SEE IN THE DATA
AND WHAT IT IS YOU WANT THEM TO SEE IN THE DATA.


DO TWO THINGS:
ONE- POINT OUT THINGS THAT ONE WOULD EXPECT TO SEE IN THE DATA AND THEN...
TWO- POINT OUT OUTLIERS.
THE EXPECTED HELPS THE AUDIENCE CONFIRM BOTH THEIR UNDERSTANDING AND THE VALIDITY OF THE DATA, BUT THE UNEXPECTED TENDS TO BE MORE INTERESTING.
EXPECTED
UNEXPECTED
CONTEXTUALIZE, ORIENT, AND INTERPRET.
THESE THREE STEPS CAN BE AS QUICK OR AS LONG AS YOU WANT.
THEY SHOULD BE STREAMLINED SO THAT THEY FLOW SMOOTHLY FROM ONE INTO THE OTHER.
CONTEXT
ORIENT
INTERPRET
CONTROLLING FOCUS HELPS THE AUDIENCE LISTEN TO YOU AND READ THE SLIDE WITHOUT HAVING TO CHOOSE ONE AT THE EXPENSE OF THE OTHER.
CONTEXT
ORIENT
INTERPRET


CONTEXT
BY TAKING THE TIME TO EXPLORE THE DATA WITH YOUR AUDIENCE,
WHAT YOU SAY ALIGNS WITH, AND EXPLAINS, WHAT THEY ARE SEEING.
ORIENT
YOUR PRESENTATION OF YOUR DATA WILL BE CLEANER AND CLEARER.
INTERPRET


YOUR AUDIENCE WILL BE-
-FOCUSED ON YOU-
-LESS DISTRACTED AND-
-LIKELY WITH YOU THE WHOLE TIME.
A
A


IT'LL SEEM...
Magical.


g^x
MIT
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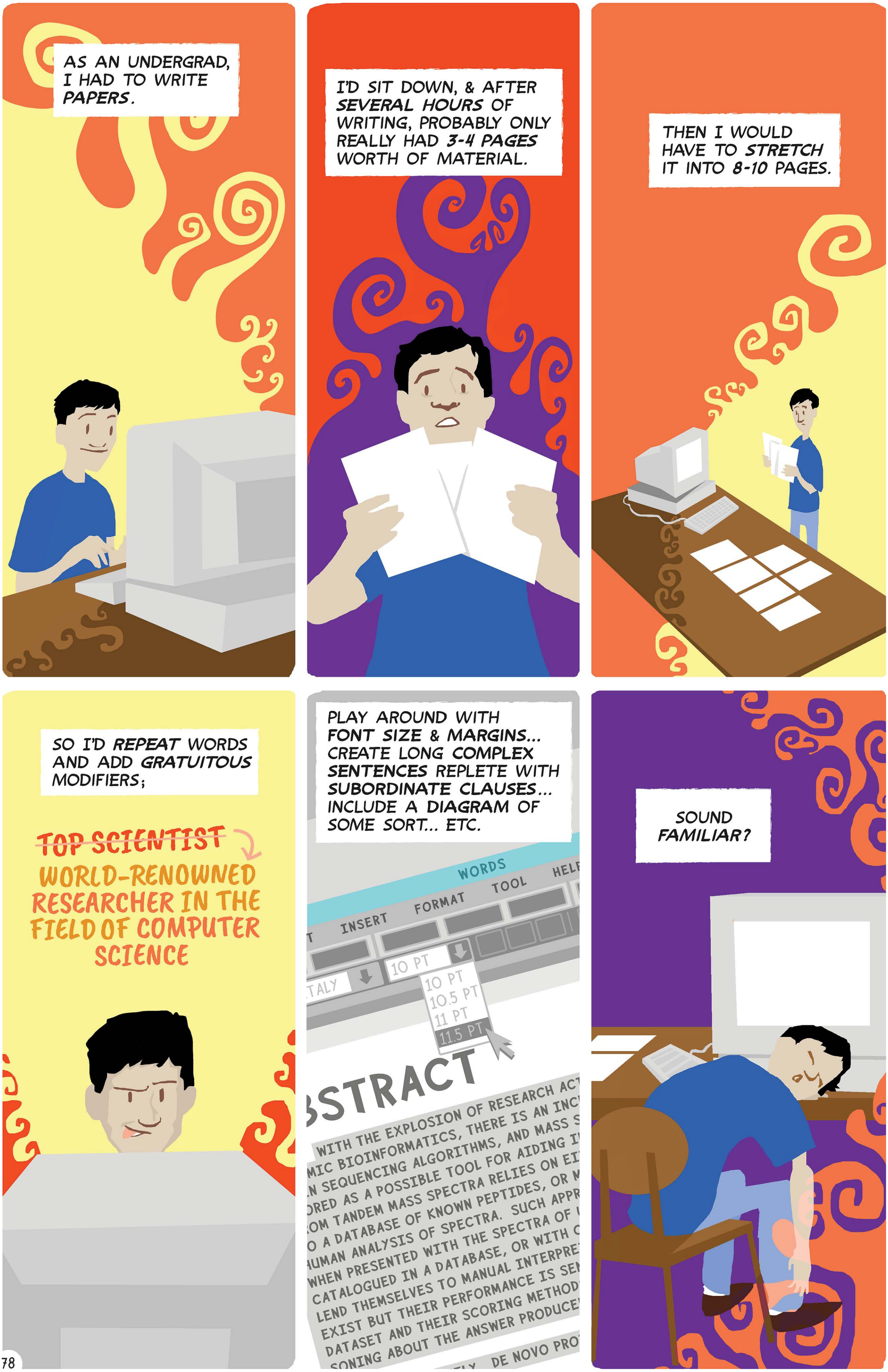
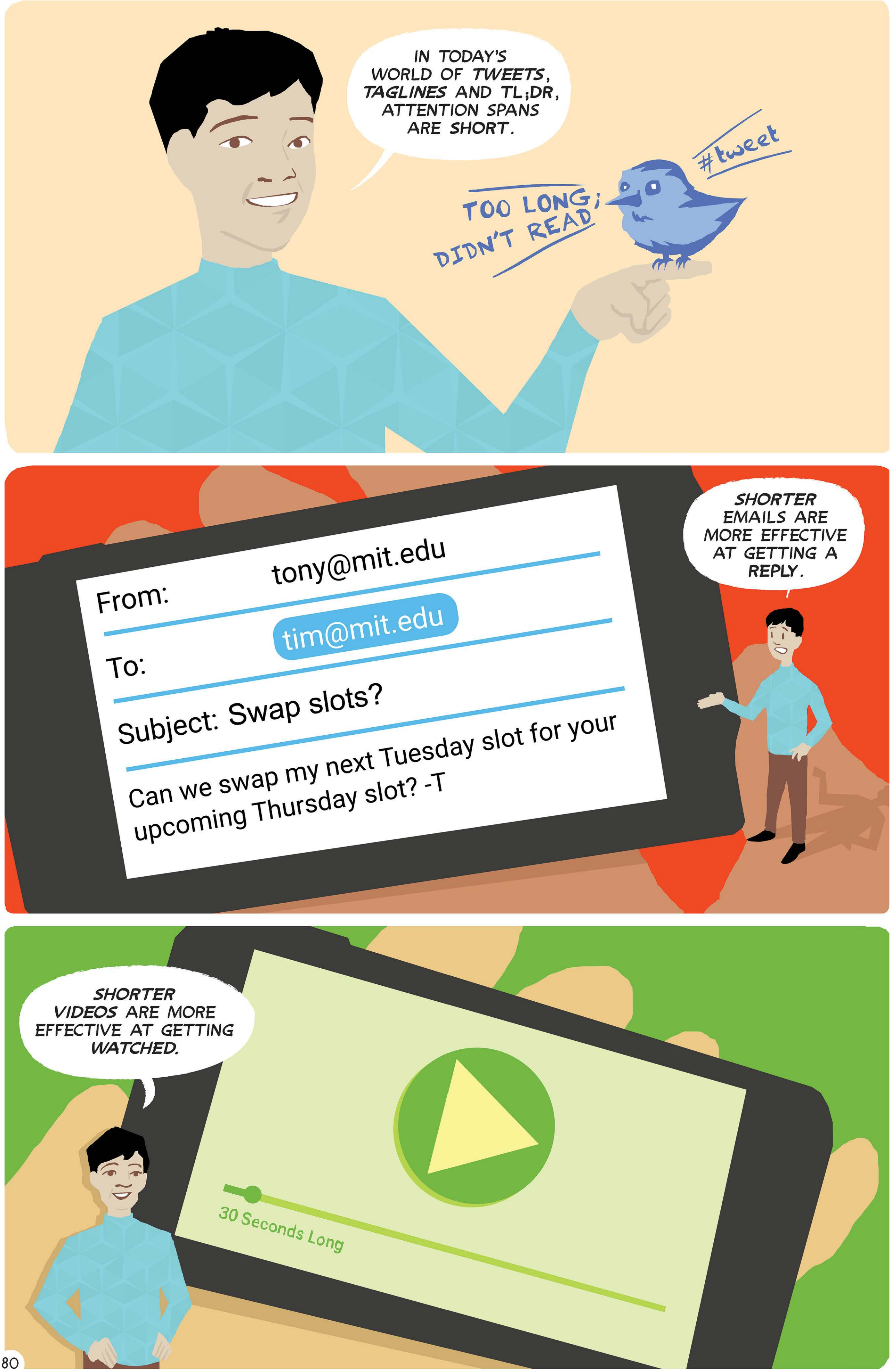
BEING
CONCISE
TONY ENG
PATRICK YURICK
LIMITED EDITION
SUMMARIZING
the
SUMMARY
STARRING
TONY ENG


AS AN UNDERGRAD, I HAD TO WRITE *PAPERS*.
I'D SIT DOWN, & AFTER *SEVERAL HOURS* OF WRITING, PROBABLY ONLY REALLY HAD *3-4 PAGES* WORTH OF MATERIAL.
THEN I WOULD HAVE TO *STRETCH* IT INTO *8-10* PAGES.
SO I'D *REPEAT* WORDS AND ADD *GRATUITOUS* MODIFIERS;
~~TOP SCIENTIST~~
WORLD-RENOWNED RESEARCHER IN THE FIELD OF COMPUTER SCIENCE
PLAY AROUND WITH **FONT SIZE & MARGINS**... CREATE LONG COMPLEX **SENTENCES** REPLETE WITH **SUBORDINATE CLAUSES**... INCLUDE A **DIAGRAM** OF SOME SORT... ETC.
WORDS
INSERT
FORMAT
TOOL
10 PT
10 PT
10.5 PT
11 PT
11.5 PT
SOUND *FAMILIAR?*


NOWADAYS, PAGE LIMITS ARE A *DIFFERENT* KIND OF **PROBLEM**.
IT'S NO LONGER AN ISSUE OF **PADDING** MY MATERIAL TO REACH A *MINIMUM THRESHOLD*.
INSTEAD, I'VE GOT TO FIND WAYS TO **CONDENSE** THE MATERIAL DOWN TO A *MAXIMUM* **CUT-OFF**.
THIS ABILITY TO WRITE *CONCISELY* AND STILL BE **CLEAR** AND **COHESIVE** IS WHAT WE'RE AIMING FOR.

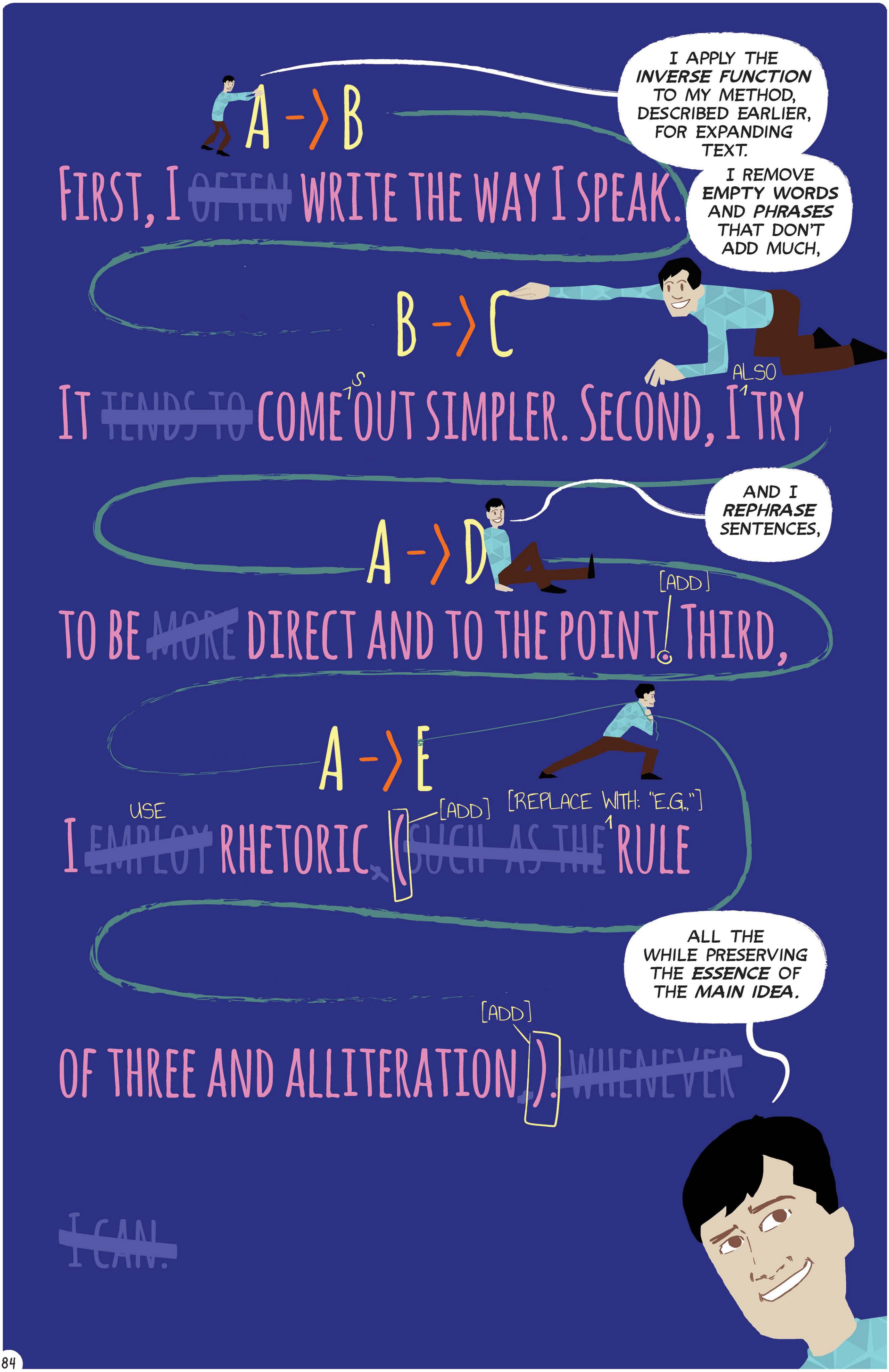

IN TODAY'S WORLD OF TWEETS, TAGLINES AND TL;DR, ATTENTION SPANS ARE SHORT.
TOO LONG; DIDN'T READ
#tweet
SHORTER EMAILS ARE MORE EFFECTIVE AT GETTING A REPLY.
From: tony@mit.edu
To: tim@mit.edu
Subject: Swap slots?
Can we swap my next Tuesday slot for your upcoming Thursday slot? -T
SHORTER VIDEOS ARE MORE EFFECTIVE AT GETTING WATCHED.
30 Seconds Long


HOW DOES ONE WRITE EXPRESSIVELY YET ECONOMICALLY?
HERE'S HOW I CONDENSE MATERIAL.
MATERIAL
FIRST, I OFTEN WRITE THE WAY I SPEAK. IT TENDS TO COME OUT SIMPLER.
SECOND, I TRY TO BE MORE DIRECT AND TO THE POINT.
THIRD, I EMPLOY RHETORIC, SUCH AS THE RULE OF THREE & ALLITERATION, WHENEVER I CAN.
1. Remember*
2. Rhetorical
3. Rules
*This is a rule of three alliteration in action.

Two of George Gopen's Ideas

TOPIC CHANGING	TOPIC STRINGING
Start the next sentence with the idea that ended the preceding sentence.	Start the next sentence with the same idea that started the preceding sentence.
A->B	A->B
B->C	A->C
C->D	A->D
D->E	A->E


FINALLY, I *ITERATE.*
I GO THROUGH A SERIES OF *REWRITES* UNTIL I REACH A "*FIXED POINT*" -
- I.E. THE TEXT *DOESN'T CHANGE* ANYMORE.
NOW COMES THE *INTERESTING* PART:
WHAT HAPPENS WITH EACH *REWRITE?*
DRAFT 2
DRAFT 3
DRAFT 4
DRAFT 5
DRAFT 6
DRAFT 7
DRAFT 8
DRAFT 10
DRAFT

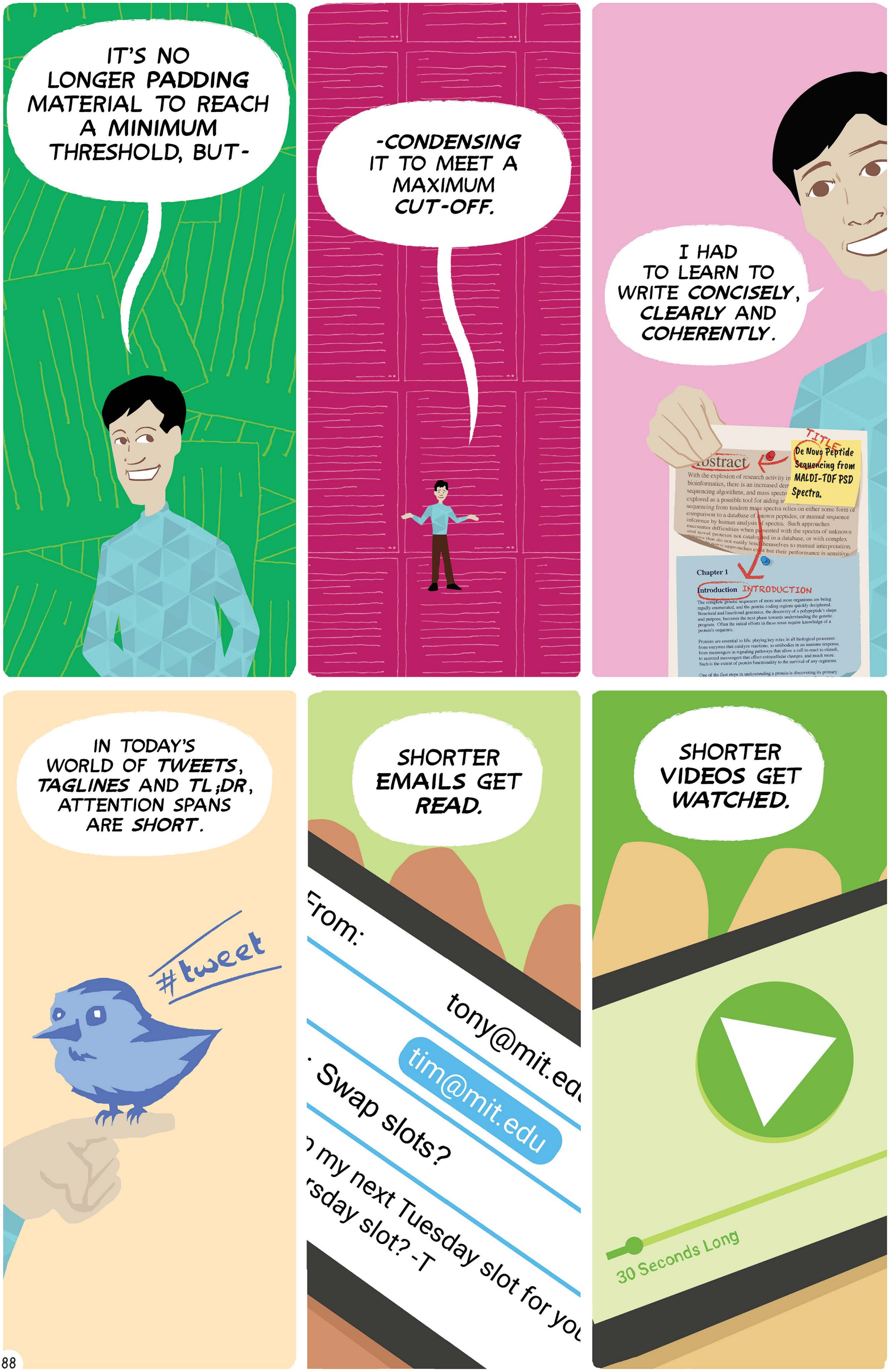


A -> B
I APPLY THE *INVERSE FUNCTION* TO MY METHOD, DESCRIBED EARLIER, FOR EXPANDING TEXT.
FIRST, I ~~OFTEN~~ WRITE THE WAY I SPEAK.
I REMOVE *EMPTY WORDS* AND *PHRASES* THAT DON'T ADD MUCH,
B -> C
IT ~~TENDS TO~~ COME S OUT SIMPLER. SECOND, I ALSO TRY
AND I *REPHRASE* SENTENCES,
A -> D
TO BE ~~MORE~~ DIRECT AND TO THE POINT [ADD] ! THIRD,
A -> E
I USE ~~EMPLOY~~ RHETORIC, [ADD] ([REPLACE WITH: "E.G.,"] ~~SUCH AS THE~~ RULE
OF THREE AND ALLITERATION, [ADD]). ~~WHENEVER~~
~~I CAN.~~
ALL THE WHILE PRESERVING THE *ESSENCE* OF THE *MAIN IDEA.*


IN SHORT, EACH REWRITE IS A ***SUMMARY*** OF THE ***PREVIOUS VERSION***.
AND THIS IS SOMETHING ***WE'RE ALL*** USED TO DOING
THE ***SUBJECT LINE*** OF AN EMAIL IS A ***SUMMARY*** OF THE ***CONTENTS*** OF THAT EMAIL.
Compose
From tony@mit.edu
To tim@mit.edu
Subject Swap slots?
Compose
Can we swap my next Tuesday slot for your upcoming Thursday slot?
-T
Send
THE ***TITLE*** OF A SLIDE IS A ***SUMMARY*** OF THE ***CONTENTS*** OF THAT SLIDE.
Two Ways to Start Sentence After A → B
Change to B
A → B
B → C
String A Along
A → B
A → C


AND HERE'S A DOOSEY:
THE TITLE OF A PAPER IS A SUMMARY OF THE ABSTRACT,
TITLE
De Novo Peptide Sequencing from MALDI-TOF PSD Spectra.
Abstract
With the explosion of research activity in
formatics, there is an increased dem
cing algorithms, and mass spectr
ed as a possible tool for aiding in
quencing from tandem mass spectra relies on either some form of
comparison to a database of known peptides, or manual sequence
inference by human analysis of spectra. Such approaches
encounter difficulties when presented with the spectra of unknown
and novel proteins not catalogued in a database, or with complex
spectra that do not easily lend themselves to manual interpretation.
approaches exist but their performance is sensitive
WHICH IS IN TURN A SUMMARY OF THE INTRODUCTION,
WHICH IS IN TURN A SUMMARY OF THE ENTIRE PAPER.
pter 1
Introduction
INTRODUCTION
The complete genetic sequences of more and more organisms are being rapidly enumerated, and the genetic coding regions quickly deciphered. Structural and functional genomics, the discovery of a polypeptide's shape and purpose, becomes the next phase towards understanding the genetic program. Often the initial efforts in these areas require knowledge of a protein's sequence.
Proteins are essential to life, playing key roles in all biological processes: from enzymes that catalyze reactions, to antibodies in an immune response, from messengers in signaling pathways that allow a cell to react to stimuli, to secreted messengers that effect extracellular changes, and much more. Such is the extent of protein functionality to the survival of any organism.
One of the first steps in understanding a protein is discovering its primary structure. Knowledge of the primary sequence characterizes the protein, offering a glimpse of what it does (its role and functionality), where
it (its targeted destination) and how it does it (its active sites,
structural motifs). Protein sequencing is the process by
THE WHOLE PAPER!


IF I WERE TO APPLY THIS TO THE *START* OF THIS *COMIC*, HERE'S WHAT I WOULD GET:
AS A STUDENT, I WROTE *PAPERS*.
THESE PAPERS HAD *PAGE LIMITS*.
BUT FOR AN *8-10 PAGE* PAPER, I PROBABLY ONLY HAD *3-4 PAGES* WORTH OF *STUFF*.
SO I FOUND WAYS TO *PAD IT*.
~~TOP SCIENTIST~~
WORLD-RENOWNED RESEARCHER IN THE FIELD OF COMPUTER SCIENCE
WORDS
INSERT
FORMAT
TOOL
10 PT
10 PT
10.5 PT
11 PT
11.5 PT
STRACT
WITH THE EXPLOSION OF RESEARCH AC
BIOINFORMATICS, THERE IS AN INC
ALGORITHMS, AND MASS S
FOR AIDING I
NOWADAYS, PAGE LIMITS ARE A *DIFFERENT PROBLEM*.



IT'S NO LONGER PADDING MATERIAL TO REACH A MINIMUM THRESHOLD, BUT-
-CONDENSING IT TO MEET A MAXIMUM CUT-OFF.
I HAD TO LEARN TO WRITE CONCISELY, CLEARLY AND COHERENTLY.
TITLE
De Novo Peptide Sequencing from MALDI-TOF PSD Spectra.
Chapter 1
Introduction
INTRODUCTION
IN TODAY'S WORLD OF TWEETS, TAGLINES AND TL;DR, ATTENTION SPANS ARE SHORT.
#tweet
SHORTER EMAILS GET READ.
From:
tony@mit.ed
tim@mit.edu
Swap slots?
my next Tuesday slot for you
rsday slot? -T
SHORTER VIDEOS GET WATCHED.
30 Seconds Long


HOW DOES ONE WRITE *EXPRESSIVELY* YET *ECONOMICALLY*?


NOW, IF I WERE TO THEN *SUMMARIZE* THIS *SUMMARY*, I'D GET:
CONCISION


IT USED TO BE THAT FOR AN 8-10 PAGE PAPER,
I ONLY HAD 3-4 PAGES WORTH OF STUFF AND HAD TO FLUFF THINGS UP.
NOWADAYS, I HAVE TOO MUCH TO SAY & NEED TO CONDENSE THINGS DOWN.
EDIT
INSERT
NEWER
10 PT
10.5 PT
11 PT
11.5 PT
ABSTRACT
OUR GOAL TODAY?
~~TOP SCIENTIST~~
WORLD-RENOWNED RESEARCHER IN THE FIELD OF COMPUTER SCIENCE
Seconds Long
#tweet
CONCISION WITH CLARITY AND COHERENCE.
ESPECIALLY BECAUSE ATTENTION SPANS ARE SHORT.
HOW DO YOU WRITE EXPRESSIVELY YET ECONOMICALLY?
HERE'S WHAT I DO.


ONE FINAL ROUND OF SUMMARIZING GETS ME TO THE FOLLOWING ONE LINE SUMMARY FOR THIS COMIC:
TOBE
CONCISE
SIMPLIFY,
REMOVE & REWRITE,
THEN...
REPEAT.
Introduction
SIMPLIFY
Proteins are essential to life,
Abstract
REMOVE AND REWRITE

WRITTEN BY
TONY ENG

SCRIPT BY
TONY ENG & PATRICK YURICK

ART BY
PATRICK YURICK

ART ASSISTS
LEEANNE BRENNEN

EDITORIAL ASSISTANCE
HEATHER KONAR

THIS COMIC IS PART OF A *LARGER PROFESSIONAL DEVELOPMENT EXPERIENCE* FOR **GRADUATE STUDENTS** TO *AID* AND *ENHANCE* **RESEARCH COMMUNICATION SKILLS**. THIS COMIC, AND OTHER RESOURCES LIKE IT, ARE AVAILABLE ONLINE AT:

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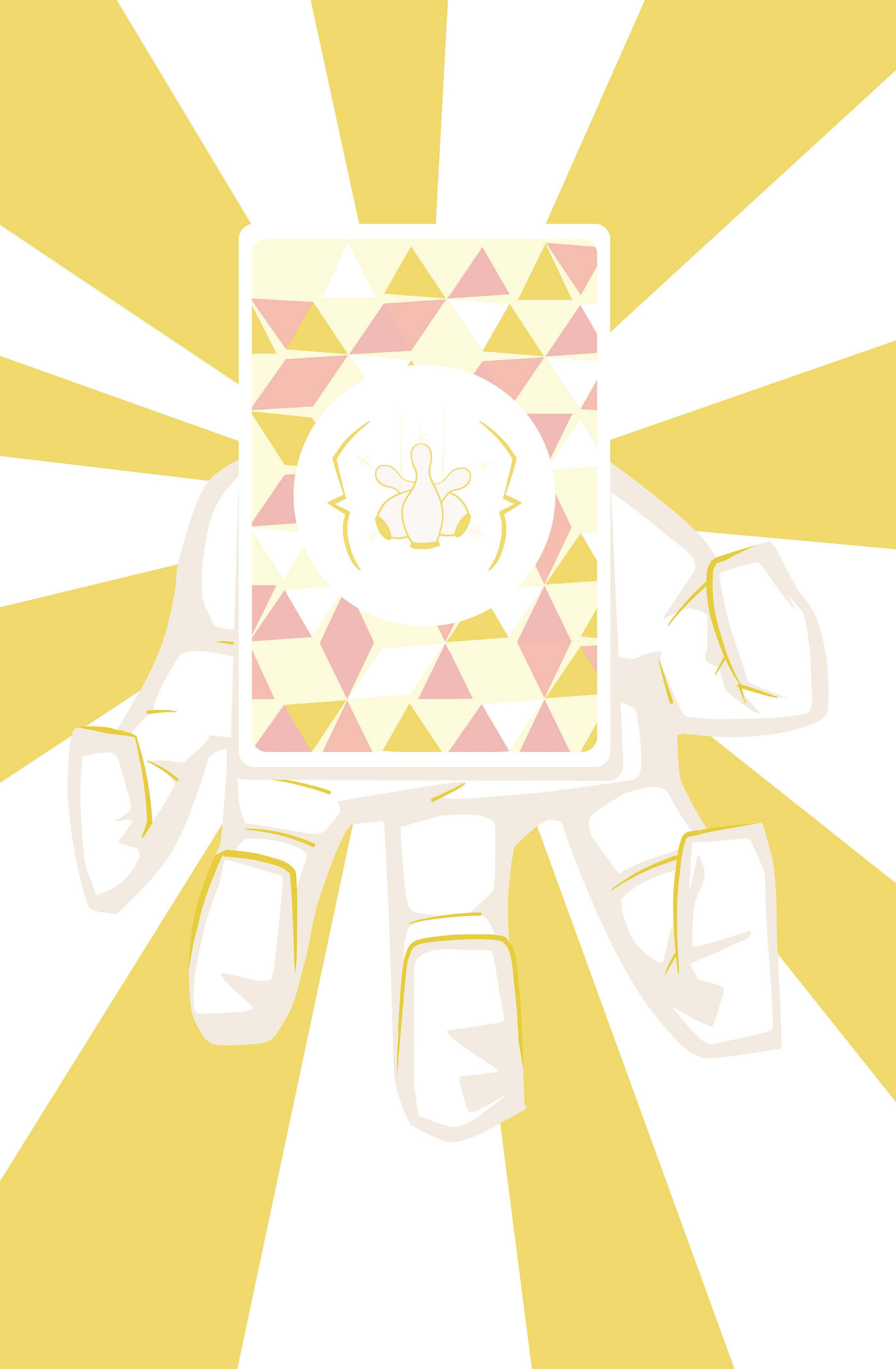


DRAFT 2
DRAFT 3
DRAFT 4
DRAFT 5
DRAFT 6
DRAFT


DRAFT

grad^x Graduate Professional Development

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Technically Speaking: An Illustrated Guide For Professional Development explores tactics and approaches to consider when when communicating research to a variety of audiences.

Topics Covered

- **Choosing appropriate language** to avoid overwhelming your audience
- **Using narrative to explain why** your research is important
- **Synthesizing prior work** to convey where yours fits in by highlighting differences
- **Controling focus** in order to minimize cognitive load when presenting data
- **Leaving time for an audience** to process when explaining how something works
- **Distilling your message** when time & attention spans are short

This comic is part of a larger professional development experience for graduate students to aid and enhance research communication skills. This comic, and other resources like it, are available online at:

https://gradx.mit.edu