Effective teaching in phonetics and phonology

Nathan Sanders

University of Toronto

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Roadmap of the talk

1. Why?
2. Course content
3. Assessment
4. Tools
5. Wrap-up

Why?

Why? Well, because...

Teaching is an important part of what we do as linguists. Current faculty train the next generation of linguists, who will go on to train the next generation, and we want to do a good job. Research shows that student learning is positively impacted when instructors are exposed to new teaching methods (Cilliers and Herman 2010, Waterman et al. 2010, Trigwell 2013, Condon et al. 2016).

Perhaps more importantly, most of our students won't go on to be linguists, but they will still be citizens of the world (Hercula 2020). Effectively arming them with knowledge of linguistics is useful, because language is relevant to nearly every human endeavour.

Why? Well, because...

Furthermore, as teaching stream faculty, my explicit research agenda includes the scholarship of teaching and learning (SOTL), and a core value of SOTL is sharing that research (Shulman 1993).

Scholars are already familiar with the value of sharing research in the discipline, and the same principle holds for SOTL.

Why? Well, because...

Although SOTL is well-established in some fields, linguistics has lagged behind, really only starting to come into its own in the past decade or so (Anderson et al. 2024). So it's even more imperative that linguists share their work on teaching, to help give SOTL more momentum in our field so we can catch up to others.

Finally, regardless of field, SOTL is still a bit mysterious for many scholars. It's simply not something most of us get training in. Sharing SOTL helps demystify it, so we can better understand it, engage with it, and benefit from it (Kelly et al. 2012, Anderson et al. 2024).

Course content

Course content

An important area where instructors can improve their teaching is in the actual content of the course. Here I discuss two aspects of course content when teaching phonetics and phonology:

- topic organization
- equity, diversity, and inclusion (EDI)

The organization of topics in a course is something I think about a lot in my own courses, and it forms a core feature of a textbook on phonetics and phonology I'm currently writing.

I want this textbook to accommodate different kinds of courses: phonetics only, phonology only, mixed, quarter system (10 weeks), US semester system (14–16 weeks), Ontario semester system (12–13 weeks), etc. This includes different instructor preferences for how to progress through topics.

For example, many phonology courses and textbooks motivate phonemes and allophones with distributional facts before morphophonological alternations. But this isn't the only way! Indeed, students seem to have an easier time with alternations than with distributions, because the relationships between allophones is more directly observable within allomorphs.

So in my textbook, I am writing both sections so they are independent and can be used in either order, with a third follow-up section that makes connections between them. This gives instructors the option to try a different order and see for themselves what works best.

Similarly, phonological features can be covered before or after phonological rules. So again, I am writing the sections independently with a third follow-up section (rules with features).

It's important for us to step back sometimes and re-think why some topics are traditionally taught in a particular order. Each of us were taught some particular way, and we became linguists, so it's easy to fall into the trap of believing that the way we learned is fine.

But maybe we would have become linguists even with poorly-taught courses! Maybe we could reach more people with different choices. We don't need to re-think everything, but it's good to re-think some things some times.

Course content

Before we even think about the order of topics, we have to come up with the topics! Beyond some very basics, we still have some flexibility. And there are a lot of topics that tend to get downplayed or even ignored in phonetics and phonology.

Here, I want to address a few topics that fall under the general umbrella of equity, diversity, and inclusion (EDI). There are lots of possible avenues to explore! See Sanders et al. 2020 and Sanders et al. 2024 for more extensive discussion and the Linguistics EDI Repository (Sanders et al. 2021–2025) for some relevant resources:

https://ledir.ling.utoronto.ca/

Side note about some interesting dialectal variation: alphabetical order (DEI) seems to be more common in the States, while avoidance of hiatus seems to be more common in Canada ([i.di.aɪ] versus [di.i.aɪ]).

First, many of our subfields have been (and continue to be) overly focused on a small number of major spoken languages, especially English (Linell 1982, Bender 2011, Woll 2013, Levisen 2019).

The bias in linguistics research has created a lens through which other languages and their structures (not to mention their users) are treated as exceptional or even potentially ignorable.

In phonetics and phonology, this is often not as much of a problem, because we are pretty good about using lots of diverse data sets.

However, we still usually focus primarily or exclusively on spoken languages. Indeed, many popular textbooks even define phonetics and/or phonology explicitly only in terms of spoken languages (e.g. Rogers 2000, Odden 2013, Hayes 2009, Ladefoged and Johnson 2015, Kennedy 2017, Fromkin et al. 2018, and O'Grady and Archibald 2019), though there a few recent notable exceptions (Anderson et al. 2022 and Dawson and Hernandez 2022).

Phonetics and phonology courses are regularly taught with no significant discussion of signed languages, but analogous courses with no significant discussion of spoken languages are rare.

When such courses do exist, they are usually overtly marked with “signed language” in the course title (“Signed Language Phonology”, etc.), while courses that focus only on spoken languages are usually unmarked (“Phonology”).

In addition, it is quite common for an undergraduate linguistics major to never work with any signed language data at all, but the reverse, for an undergraduate major to never work with any spoken language data, would be viewed by most linguists as highly improper.

This attitude implicitly treats signed languages, deafness, and deaf communities as atypical phenomena that can be minimized or even outright ignored.

It also means we miss out on a huge amount of relevant knowledge from other modalities, preventing us from gaining a full understanding of how language actually works.

What can we do?

- discuss other modalities (and multimodality!) more openly; even acknowledging they exist (and have phonetics and phonology) is a great first step
- assign relevant readings
- learn enough to teach a little bit of signed language phonetics and phonology
- assign problems in signed language phonetics and phonology, such as the following sample

For each of the following pairs of signs, list which of the manual parameters they differ for: handshape, orientation, location, and/or movement. You can ignore nonmanual articulation. For example, if you were given the ASL signs for MY and SORRY to compare, you would list that they have different handshapes and movements. You don't need to specify the details of the differences, just list the parameters that differ. If handshape, orientation, or location change during a sign due to movement, consider only the starting handshpare, orientation, or location for purposes of comparison between signs.

a. Croatian Sign Language (Hrvatski znakovni jezik, HZJ)

BROWN https://media.spreadthesign.com/video/mp4/42/405821.mp4
BLUE https://media.spreadthesign.com/video/mp4/42/405025.mp4

b. German Sign Language (Deutsche Gebärdensprache, DGS)

BROWN https://media.spreadthesign.com/video/mp4/9/7657.mp4
BLUE https://media.spreadthesign.com/video/mp4/9/6091.mp4

c. Japanese Sign Language (日本手話, Nihon Shuwa, NS):

BROWN https://media.spreadthesign.com/video/mp4/7/349356.mp4
BLUE https://media.spreadthesign.com/video/mp4/7/342135.mp4

d. French Sign Language (Langue des signes française, LSF)

BROWN https://media.spreadthesign.com/video/mp4/10/7656.mp4
BLUE https://media.spreadthesign.com/video/mp4/10/6092.mp4

An important topic in EDI relevant to phonetics is gender diversity.

In phonetics, we often use tube models of the human vocal tract to make approximations of the acoustic properties of certain articulations. In particular, students are often taught to calculate resonant frequencies of the vocal tract using 17.5 cm for the vocal tract length. This nicely divides into a close approximation of the speed of sound (35,000 cm/sec).

But this mathematical niceness is also often presented as a “typical” (Gobl and Ní Chasaide 2010: 380) or “average” (Behrman 2018: 216) vocal tract length for adult men (or sometimes for humans generally).

Doing so perpetuates men as a default, which is already a problem in the sciences.

It also masks body diversity within and across genders. Gender categories are not biologically homogenous. 17.5 cm may be a fine approximation for the vocal tract length of some men (thought it's a bit higher than the real average of 16–17 cm; Fitch and Giedd 1999, Groll et al. 2020), as well as some women, but not all men, let alone all humans.

Many transgender people may also undergo gender-affirming hormone-replacement therapy and/or speech therapy, which can alter their acoustics and further complicate any notion of a default relationship between sex, gender, and vocal quality. Indeed, some of the differences we think are biological may in fact be socially constructed as part of performing gender (Zimman 2018).

Phonetics courses often also cover some aspects of auditory perception, usually framed in terms of the structural properties of the auditory canal, the inner ear, the cochlea, etc.

However, there is much research showing that social information also plays an important role in speech perception, so we cannot rely just on the physical mechanics of the auditory system.

For example, Babel and Russell 2015 show that native speakers of Canadian English are perceived as less intelligible if they are Chinese and their faces are visible. The effect goes away for white speakers or when Chinese faces are hidden. This has many social impacts that students need to be aware of, for example, in how they may subconsciously rate racialized instructors worse than white instructors.

There are other well-known social biases that affect perception (e.g. perceived gender causes a shift in perceived category boundary for a [s]-[ʃ] continuum; Strand and Johnson 1996). These issues aren't just in the realm of sociolinguistics or psycholinguistics. They are part of our perception and should be included in any unit on perception in a phonetics course.

More broadly, just because a lot of linguistics is science-y doesn't mean we get a free pass to ignore the social component of language.

Languages do not exist separately from the people who use them.

Utterances are never made without social and/or linguistic context.

There is no default language user.

We need to erase these concepts from our teaching.

Many of our students do not have the privilege of being able to have their identities ignored, because “default” and “contextless” are usually just code for white, affluent, educated, male, hearing, cisgender, neurotypical, etc.

So when we set up idealized scenarios that ignore or minimize certain marginalized social identities, we are excluding some of our students from the conversation, reinforcing the barriers and biases these students often already face.

Assessment

Assessment

There are lots of topics that fall under assessment, but in the interest of time, I will focus on just one idea for an innovative assignment that I have found to be particularly successful in my phonology course.

I generally find the idea of timed exams problematic in linguistics courses, especially beyond the introductory level. Solving a phonology problem takes time, and sometimes, the pattern can elude even the brightest students. And it just seems odd to reward or penalize students for speed, rather than for their actual knowledge.

But take-home problems can also be tricky. Students could just look up the answer and/or collaborate. But why shouldn't they? Real linguists do research and collaborate with each other all the time!

Assessment

To solve these issues, I designed a final project to replace the final exam in our second-year phonology course. The students are tasked with creating their own phonology assignment, using a language they make up, with the following properties:

- reasonable phonotactics
- at least four distinct phonological rules (of the same general types seen in the course) that each trigger morphophonological alternations
- at least one rule must involve syllable structure, stress, quantity, or tone
- the rules must require at least two total crucial rule orderings, at least one of which must be opaque

Assessment

The students work on this throughout the semester, getting feedback from me and the TAs along the way.

Crucially, they must also work with other students to solve each other's problems! This helps them identify where they have flaws in the assignment (e.g. not enough evidence, alternate possible analyses, etc.).

Assessment

Feedback from students on this assignment has been overwhelmingly positive. I received many comments from students that they really learned how phonology works much better by having to design their own problem. I also have gotten zero complaints from students for not having a more traditional assignment. (Note that they do get more traditional phonology problems as homework throughout the course, so they aren't being deprived of a more standard education in phonology.)

This kind of assignment promotes a different way of thinking than we traditionally test our students on, allowing them to get a fuller understanding of the material.

A side benefit is that it gives early training in assignment design to students who will end up becoming professors themselves!

Tools

Tools

Finally, I want to talk about a few kinds of tools I developed that I use in my phonetics and phonology courses:

- educational games
- online data set generator

In a forthcoming book chapter, Sanders and Daidone argue that educational games are great tools for teaching phonetics and phonology specifically. (Other subfields are discussed by various authors elsewhere in the same volume.)

Educational games are a type of active learning, which is an activity that directly engages students in the process of learning, as opposed to the passive learning of traditional lectures.

Lots of research shows that active learning improves student performance (Hake 1998, Freeman et al. 2014, Michael 2006, etc.).

However, despite the evidence, many instructors are reluctant to incorporate active learning into their teaching.

- (perception of) extra effort (Henderson and Dancy 2007)
- students may not *feel* they are performing better from active learning even when they are (Deslauriers et al. 2019)

So instructors often stick to traditional methods that are easier to implement and don't risk creating negative sentiments from students.

Why put in extra work and also take a hit to your course evaluations?

Educational games have long been known to reap the benefits of active learning while solving the issue of student buy-in (Cruickshank and Telfer 1980, Lepper and Cordova 1992, Sugar and Takacs 1999, Massey et al. 2005, Ritzo and Robinson 2006, etc.).

It is also usually easy to implement games in the classroom, sometimes requiring little more than pencil and paper or adaptation of existing games.

On a superficial level, most any subject can have a game, since most course content can usually be converted into pairs for games based on question-answer, matching, collecting, etc.

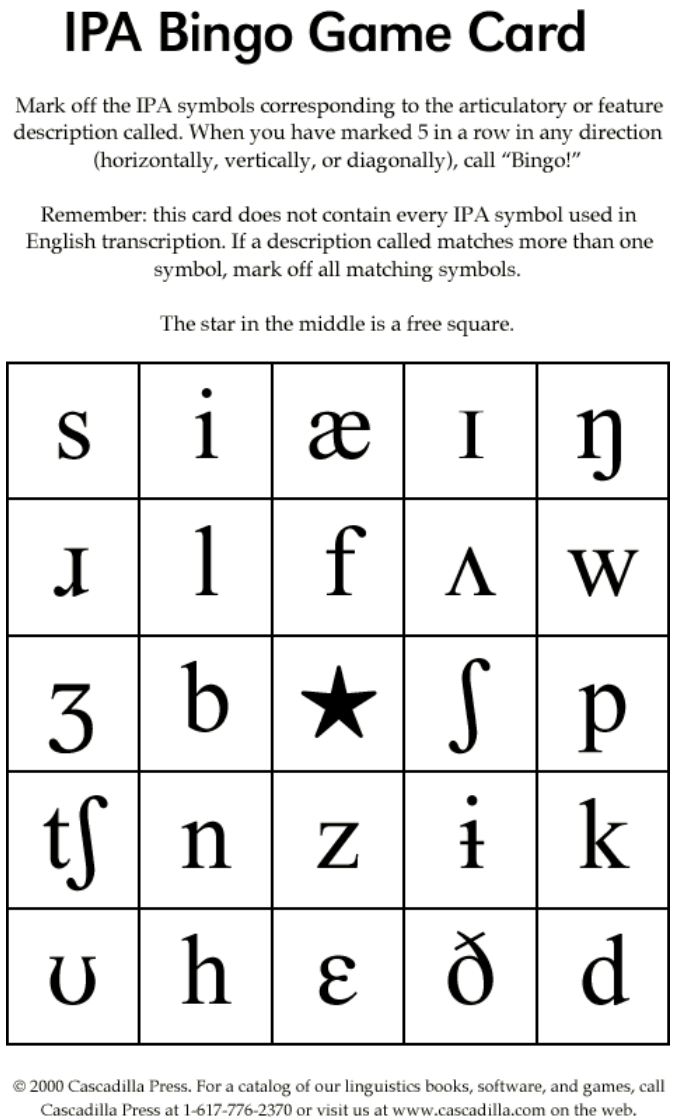
In phonetics and phonology, we have many such pairs:

- voiceless alveolar fricative $\Leftrightarrow$ [s] *(notation)*
- rate of vocal fold vibration $\Leftrightarrow$ fundamental frequency *(definition)*
- raised velum, no nasal airflow $\Leftrightarrow$ [−nasal] *(formal object)*

A notable example is Lynn Santlemann's (2000) IPA Bingo game, which has become a staple in many linguistics courses.

It's a straightforward implementation of Bingo, with rules that are easy to explain (and already familiar to many):

- cards with random set of symbols
- instructor secretly selects symbol
- instructor calls out definition or articulates phone
- students mark matching symbol
- students win with five in a row



IPA Bingo Game Card

Mark off the IPA symbols corresponding to the articulatory or feature description called. When you have marked 5 in a row in any direction (horizontally, vertically, or diagonally), call "Bingo!"

Remember: this card does not contain every IPA symbol used in English transcription. If a description called matches more than one symbol, mark off all matching symbols.

The star in the middle is a free square.

s	i	æ	ɪ	ŋ
ɹ	l	f	ʌ	w
ʒ	b	★	ʃ	p
tʃ	n	z	ɨ	k
ʊ	h	ɛ	ð	d

I made my own version at some point in order to use the specific symbols I preferred. Using my files as a base, I worked with Professor Fatima Hamlaoui from the University of Toronto's French Department to adapt IPA Bingo for her French linguistics courses.

General North American English Phonetic Bingo

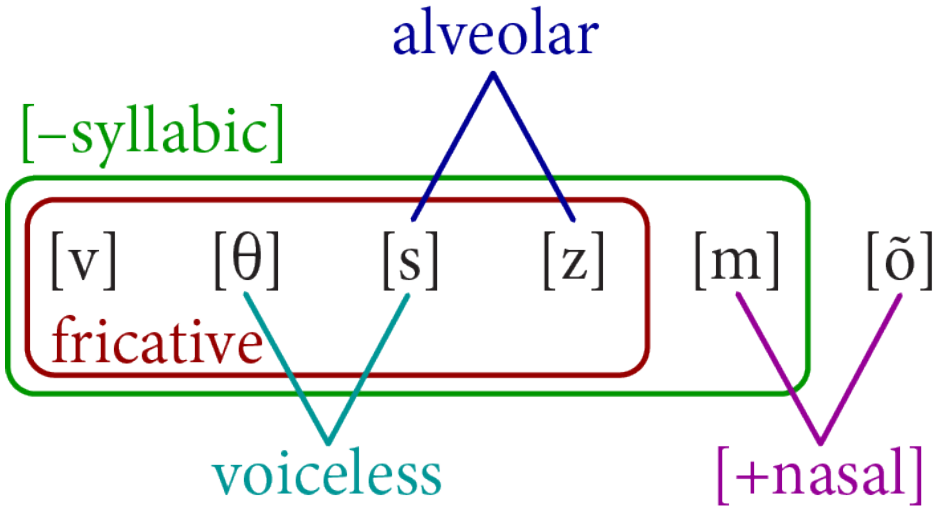
i	t	s	d	ʌ
w	aʊ	v	d͡ʒ	l
f	ə	fri spes	ɑ/ɒ	ɔɪ
ʒ	ʃ	ð	g	b
m	ɛ	z	p	ɔ

Le Bingo Phonétique Français

y	f	l	ø	ɔ
w	v	t	ʁ	o
ɛ̃	d	ɛspas libʁ	ɥ	ə
ʃ	g	s	m	i
z	ʒ	ã	ɛ	p

But phonetics and phonology content is not just a set of $A \Leftrightarrow B$ pairs.

There are complex multidimensional overlapping structures among IPA symbols, phonological features, and natural classes.



Direct use of these structures can result in more sophisticated games.

The extra sophistication can be more engaging for students, especially those who are gaming enthusiasts.

But more importantly, it allows the structure of the game itself to reinforce the structure of the content by requiring students to see more complex multi-pronged relationships.

I've created a bunch of games for phonetics and phonology of different types, all available on my website:

http://sanders.phonologist.org/lxgames.html

I'll go through some of them today to demonstrate how they work and discuss some of the underlying design principles.

Educational games: IPA Hunt

IPA Hunt is based on Battleship. Divide students into two teams (ideally 1–2 players each). Each team gets one gameboard made of two grids:

home grid

i	y	i̱	y̱	ɨ	ʉ	ɯ̟	u̟	ɯ	u
i̟	y̟	ɪ	ʏ	ɨ̟	ʉ̟	ʊ̟	ʊ	ɯ̟	u̟
e	ø	ë	ø̈	ɘ	ɵ	ɤ̈	ö	ɤ	o
ɛ̟	œ̟	ə̟	ɜ̟	ə	ɘ̟	ə̱	ɵ̟	ʌ̟	ɔ̟
ɛ	œ	ɛ̱	œ̱	ɜ	ɞ	ʌ̟	ɔ̟	ʌ	ɔ
æ	æ̟	å	œ̆	ɐ	ɐ̟	ɑ̆	ɒ̆	ɑ̟	ɒ̟
a	ɶ	ä	ɶ̈	ɐ̟	ɐ̞	ä	ɒ̈	ɑ	ɒ

enemy grid

i	y	i̱	y̱	ɨ	ʉ	ɯ̟	u̟	ɯ	u
i̟	y̟	ɪ	ʏ	ɨ̟	ʉ̟	ʊ̟	ʊ	ɯ̟	u̟
e	ø	ë	ø̈	ɘ	ɵ	ɤ̈	ö	ɤ	o
ɛ̟	œ̟	ə̟	ɜ̟	ə	ɘ̟	ə̱	ɵ̟	ʌ̟	ɔ̟
ɛ	œ	ɛ̱	œ̱	ɜ	ɞ	ʌ̟	ɔ̟	ʌ	ɔ
æ	æ̟	å	œ̆	ɐ	ɐ̟	ɑ̆	ɒ̆	ɑ̟	ɒ̟
a	ɶ	ä	ɶ̈	ɐ̟	ɐ̞	ä	ɒ̈	ɑ	ɒ

small group

small group

medium group

medium group

large group

Educational games: IPA Hunt

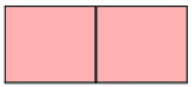
Each team chooses their own starting vowel groups (like Battleship ships). Must be contiguous and in a straight line. Two groups of two, two groups of three, and one group of four.

home grid

i	y	i̱	y̱	ɨ	ʉ	ɯ̟	u̟	ɯ	u
i̞	y̞	ɪ	ʏ	ɨ̞	ʉ̞	ʊ̝	ʊ	ɯ̽	u̽
e	ø	ë	ö	ɘ	ɵ	ɤ̈	ö	ɤ	o
ɛ̝	œ̝	ə̞	ɜ̞	ə	ɘ̞	ə̹	ɵ̞	ʌ̝	ɔ̝
ɛ	œ	ɛ̱	œ̱	ɜ	ɞ	ʌ̟	ɔ̟	ʌ	ɔ
æ	æ̞	å̆	œ̆	ɐ	ɐ̞	ɑ̆	ɒ̆	ɑ̟	ɒ̟
a	ɶ	ä	ɶ̈	ɐ̟	ɐ̹	ä	ɒ̈	ɑ	ɒ

enemy grid

i	y	i̱	y̱	ɨ	ʉ	ɯ̟	u̟	ɯ	u
i̞	y̞	ɪ	ʏ	ɨ̞	ʉ̞	ʊ̝	ʊ	ɯ̽	u̽
e	ø	ë	ö	ɘ	ɵ	ɤ̈	ö	ɤ	o
ɛ̝	œ̝	ə̞	ɜ̞	ə	ɘ̞	ə̹	ɵ̞	ʌ̝	ɔ̝
ɛ	œ	ɛ̱	œ̱	ɜ	ɞ	ʌ̟	ɔ̟	ʌ	ɔ
æ	æ̞	å̆	œ̆	ɐ	ɐ̞	ɑ̆	ɒ̆	ɑ̟	ɒ̟
a	ɶ	ä	ɶ̈	ɐ̟	ɐ̹	ä	ɒ̈	ɑ	ɒ



small group

small group

medium group

medium group

large group

Educational games: IPA Hunt

Teams alternate trying to guess the vowel in their enemy's group by calling out a vowel somewhere from the grid.

The vowel must be specified enough to be uniquely identifiable, and must be specified with phonetic terminology.

For example, the vowel [œ̱] could be called out as "near-front lower mid round vowel" or as "retracted lax mid front round vowel".

It would not be valid to call it out by grid position with something like "fifth row, fourth column". The point here is to reinforce the link between terminology, IPA symbols, and position in vowel space.

If the called vowel is not part of an enemy's group, the enemy says "miss". Both teams should mark the appropriate grid with an **X** to indicate that that spot has been called and what the result was.

If the called vowel is part of an enemy's group, the enemy says "hit". Both teams should mark the appropriate grid with an **O** to indicate that that spot has been called and what the result was.

Educational games: IPA Hunt

Possible gamestate after two turns, where the home team has called [ʊ̟] and scored a hit (marked with **O** on the enemy grid), while the enemy has called [œ̲] and scored a miss (marked with **X** on the home grid). The enemy team sheet would have these marks reversed.

home grid

i	y	i̲	y̲	ɨ	ʉ	ɯ̟	u̟	ɯ	u
i̟	y̟	ɪ	ʏ	ɨ̟	ʉ̟	ʊ̟	ʊ	ɯ̟	u̟
e	ø	ë	ö	ɘ	ɵ	ɤ̈	ö	ɤ	o
ɛ̟	œ̟	ə̟	ə̟	ə	ə̟	ə̲	ə̲	ʌ̟	ɔ̟
ɛ	œ	ɛ̲	œ̲	ɜ	ɞ	ʌ̟	ɔ̟	ʌ	ɔ
æ	æ̟	ǎ	œ̌	ɐ	ɐ̟	ɑ̌	ɒ̌	ɑ̟	ɒ̟
a	ɶ	ä	ɶ̈	ɐ̟	ɐ̞	ɑ̈	ɒ̈	ɑ	ɒ

enemy grid

i	y	i̲	y̲	ɨ	ʉ	ɯ̟	u̟	ɯ	u
i̟	y̟	ɪ	ʏ	ɨ̟	ʉ̟	ʊ̟	ʊ	ɯ̟	u̟
e	ø	ë	ö	ɘ	ɵ	ɤ̈	ö	ɤ	o
ɛ̟	œ̟	ə̟	ə̟	ə	ə̟	ə̲	ə̲	ʌ̟	ɔ̟
ɛ	œ	ɛ̲	œ̲	ɜ	ɞ	ʌ̟	ɔ̟	ʌ	ɔ
æ	æ̟	ǎ	œ̌	ɐ	ɐ̟	ɑ̌	ɒ̌	ɑ̟	ɒ̟
a	ɶ	ä	ɶ̈	ɐ̟	ɐ̞	ɑ̈	ɒ̈	ɑ	ɒ

small group | small group | medium group | medium group | large group

Educational games: IPA Hunt

If a team calls out a vowel that results in a hit that completes a group, the enemy team must state that a group has been completely found and what size it is (small, medium, large).

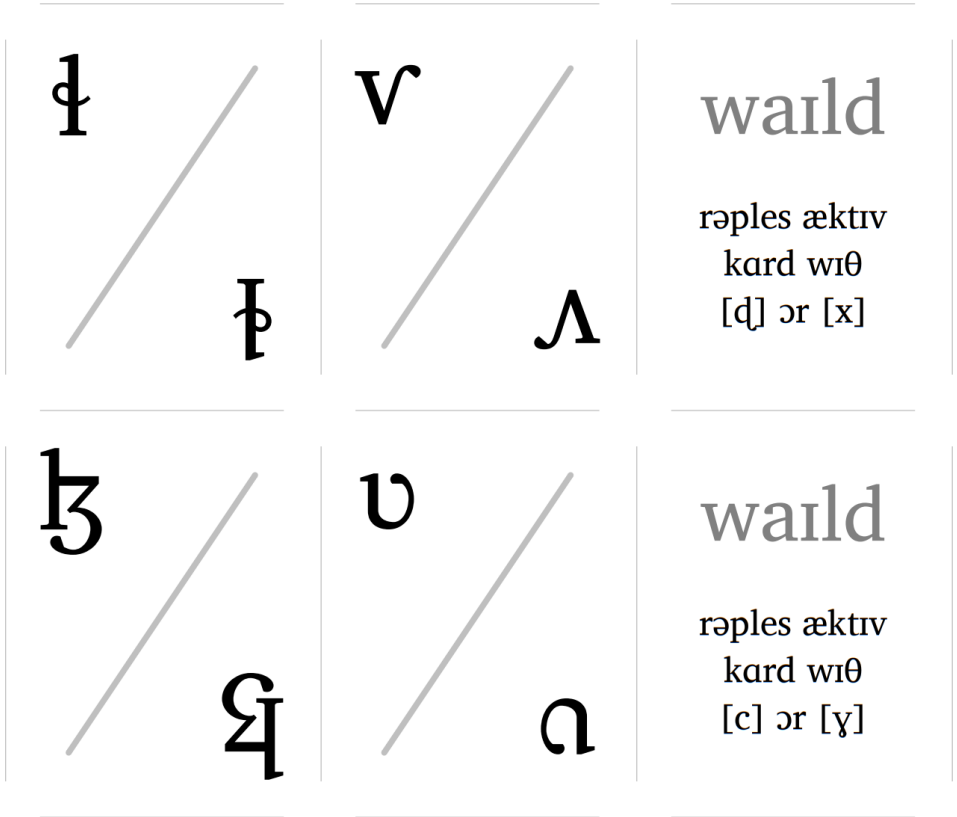
Such a hit allows the active team to immediately guess another vowel on their turn, and this can be chained again and again, as long each subsequent hit also completes a group.

The game ends when one team has found all the vowels in all five of the other team's groups.

Educational games: IPA Discard

IPA Discard is similar to Uno and other members of the Crazy Eights family of card games.

Divide students into groups of about 4–5 with one deck of cards.



Educational games: IPA Discard

Choose a starting player, who deals out five cards to each player in the group. The remaining cards are the draw pile.

The top card of the draw pile is flipped over to be the active card.

Beginning with the starting player, each player must play a card from their hand that matches the active card in either place or manner.

Again, the point here is to reinforce course content through gameplay. Here, matching reinforces natural classes; cards don't match for irrelevant properties (colour, symbol shape, etc.).

Educational games: IPA Discard

places: bilabial, labiodental, dental, alveolar, retroflex, alveolopalatal, palatal, velar, uvular, pharyngeal, epiglottal

manners: plosives, implosives, ejectives (stops and fricatives), clicks, nasal stops, pulmonic fricatives (incl. lateral), trills/taps/flaps (incl. lateral), approximants (incl. lateral)

Note that the game is intended for advanced students, so it has very few English phones!

If the player does not have a matching card in their hand, they must draw a card from the draw pile, and their turn ends (they cannot play the drawn card).

Play then continues to the next player going clockwise.

The game ends when one player plays the last card in their hand.

Educational games: IPA Discard

There are special wild cards that can be played on any active card. They require the player to declare the new active symbol from one of the two options on the card.

There are duplicates of some symbols in order to help balance the game. For example, there are only two alveolopalatals [ɕ] and [ʑ], so there are three copies of each in the deck to make them more able to match each other.

Blank cards are included to allow for customization of the game, such as adding English phones or special cards like reverse and skip.

Rule modifications can also liven up the game (e.g. because there are so many fricatives, require them to match in voicing, too).

Educational games: Flippity

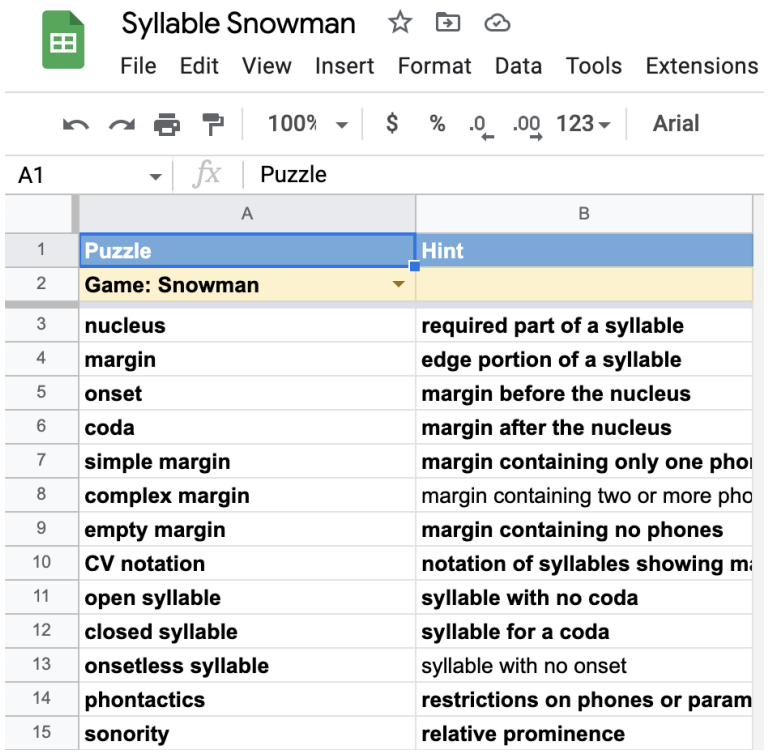
Steve Fortna has a free website called Flippity (2013–2024), with templates that allow easy creation of a variety of online games. Flippity is available at:

https://www.flippity.net/

Most of Flippity's games connect directly with Google sheets, so it's just a matter of filling in the relevant information and clicking the right buttons to "publish" the sheet and make it accessible to Flippity.

Educational games: Flippity

Flippity has a set of word guessing games in the style of Hangman, using different themes that are a bit less problematic than the traditional version: picking apples off a tree, a melting snowman, etc.



Syllable Snowman

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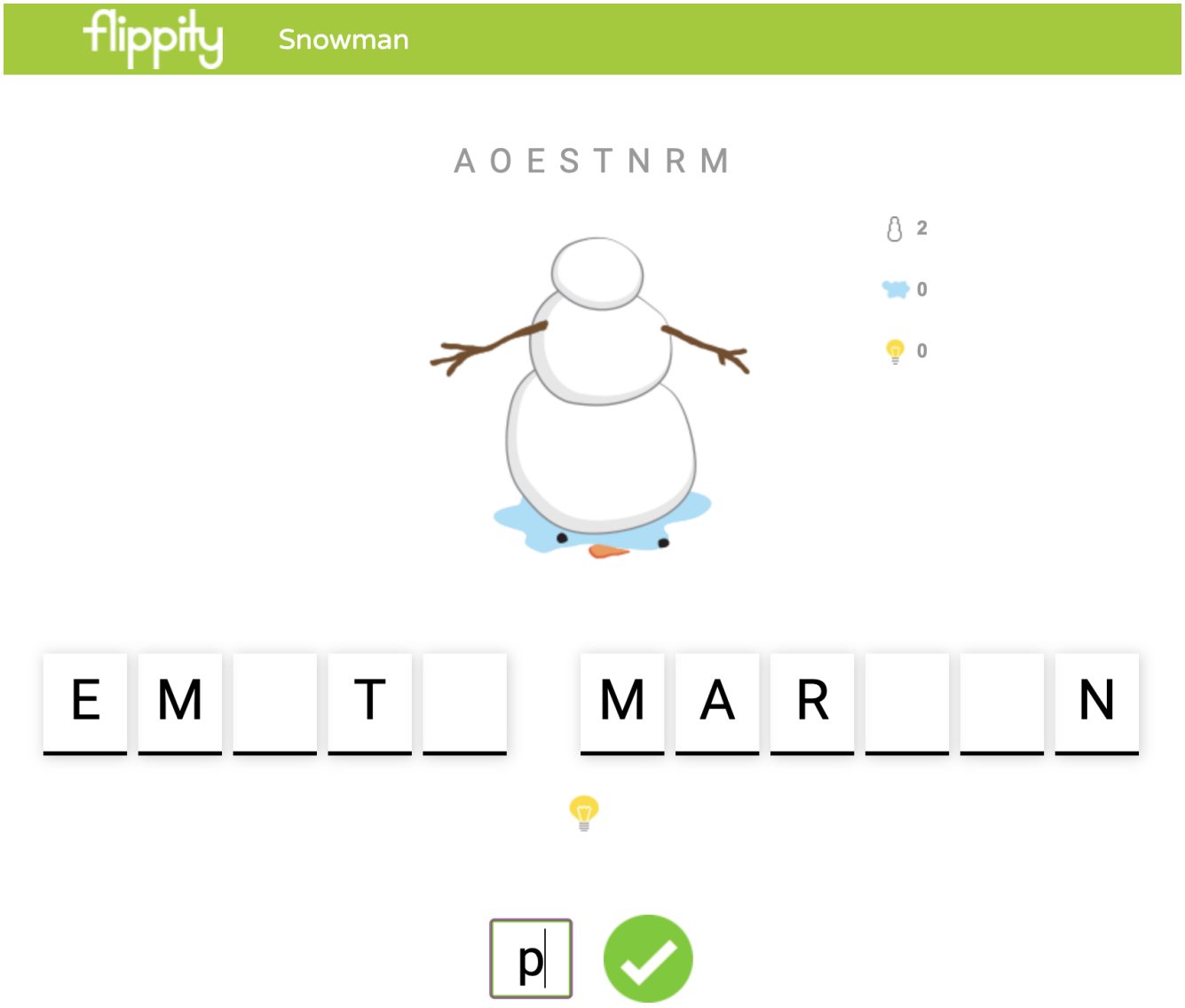
A1 | fx | Puzzle

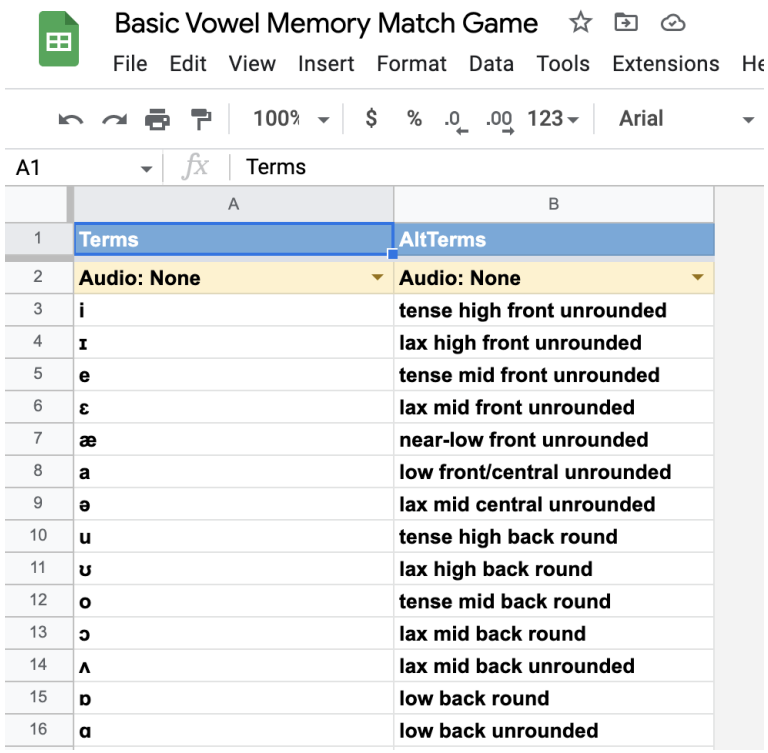
	A	B
1	**Puzzle**	**Hint**
2	**Game: Snowman**	
3	**nucleus**	**required part of a syllable**
4	**margin**	**edge portion of a syllable**
5	**onset**	**margin before the nucleus**
6	**coda**	**margin after the nucleus**
7	**simple margin**	**margin containing only one pho**
8	**complex margin**	margin containing two or more pho
9	**empty margin**	**margin containing no phones**
10	**CV notation**	**notation of syllables showing m**
11	**open syllable**	**syllable with no coda**
12	**closed syllable**	**syllable for a coda**
13	**onsetless syllable**	syllable with no onset
14	**phontactics**	**restrictions on phones or param**
15	**sonority**	**relative prominence**

Educational games: Flippity



Educational games: Flippity

Flippity also has a set of matching games similar to the card game Concentration, in which players must pick cards to form matching pairs. The same set of pairs can be used for either a straightforward matching game (with face-up cards) or a bit more challenging game requiring memory (with face-down cards).



Basic Vowel Memory Match Game

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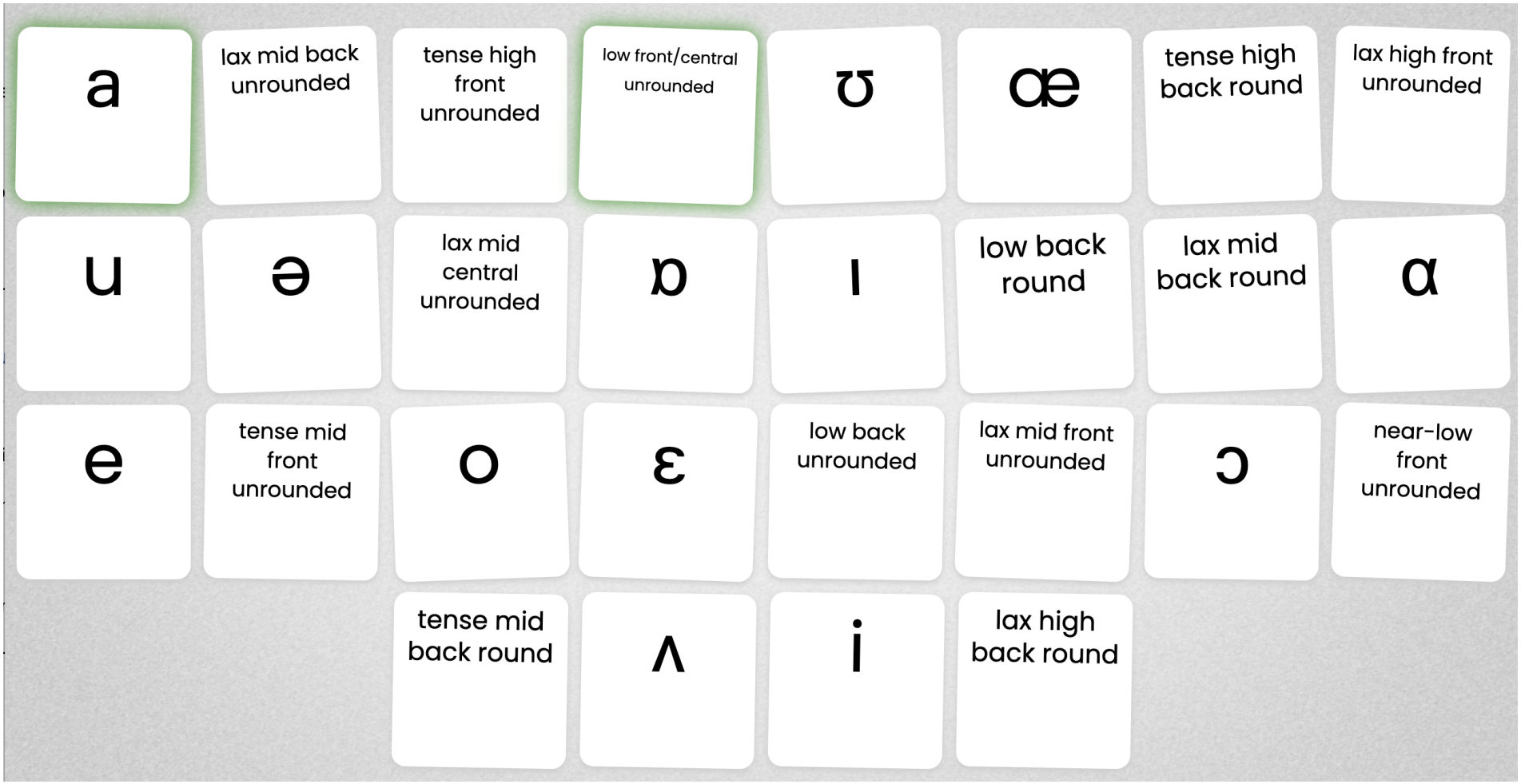
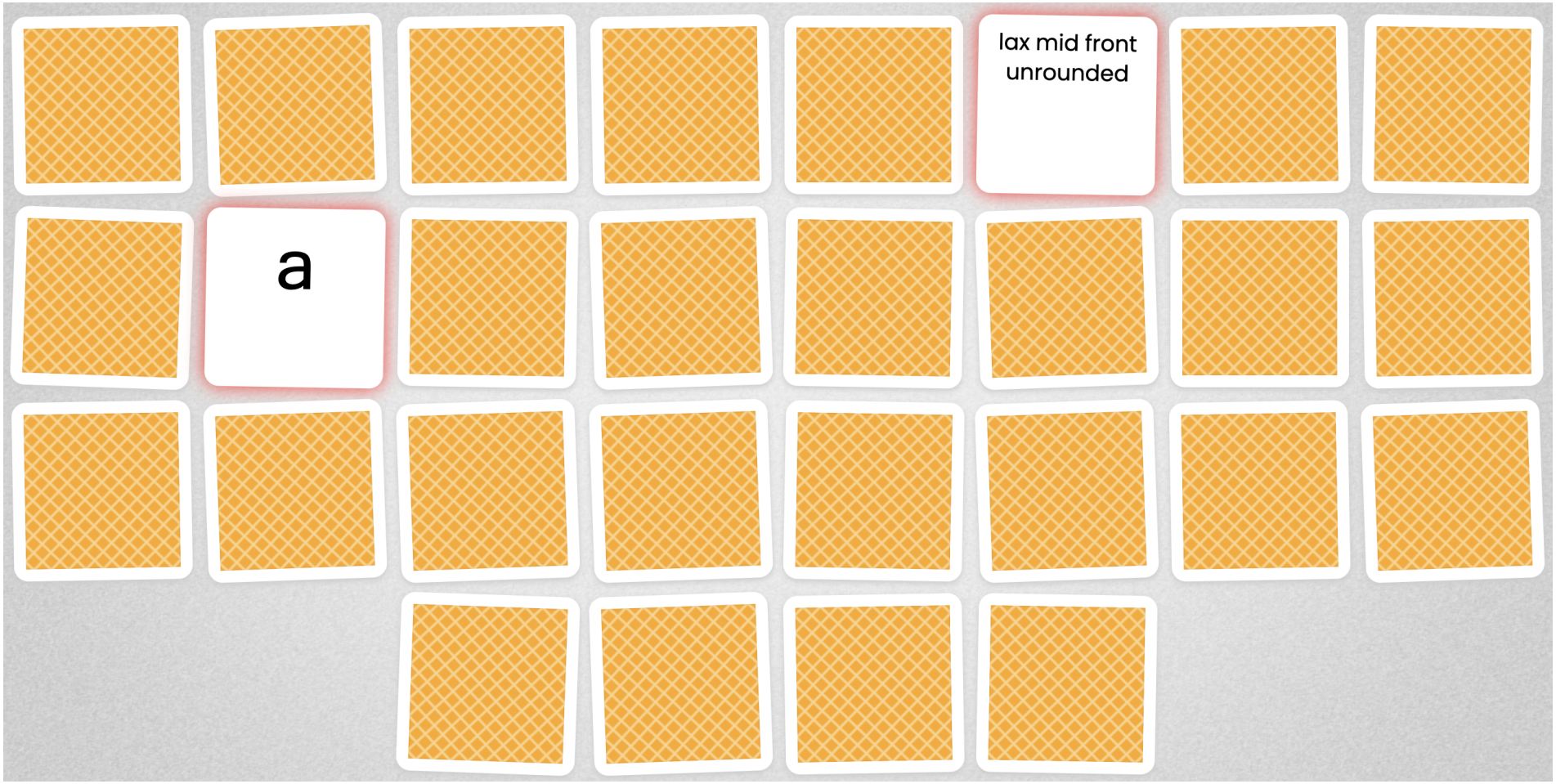
A1 fx Terms

	A	B
1	Terms	AltTerms
2	Audio: None	Audio: None
3	i	tense high front unrounded
4	ɪ	lax high front unrounded
5	e	tense mid front unrounded
6	ɛ	lax mid front unrounded
7	æ	near-low front unrounded
8	a	low front/central unrounded
9	ə	lax mid central unrounded
10	u	tense high back round
11	ʊ	lax high back round
12	o	tense mid back round
13	ɔ	lax mid back round
14	ʌ	lax mid back unrounded
15	ɒ	low back round
16	ɑ	low back unrounded

Educational games: Flippity



Educational games: Flippity



Educational games: Flippity

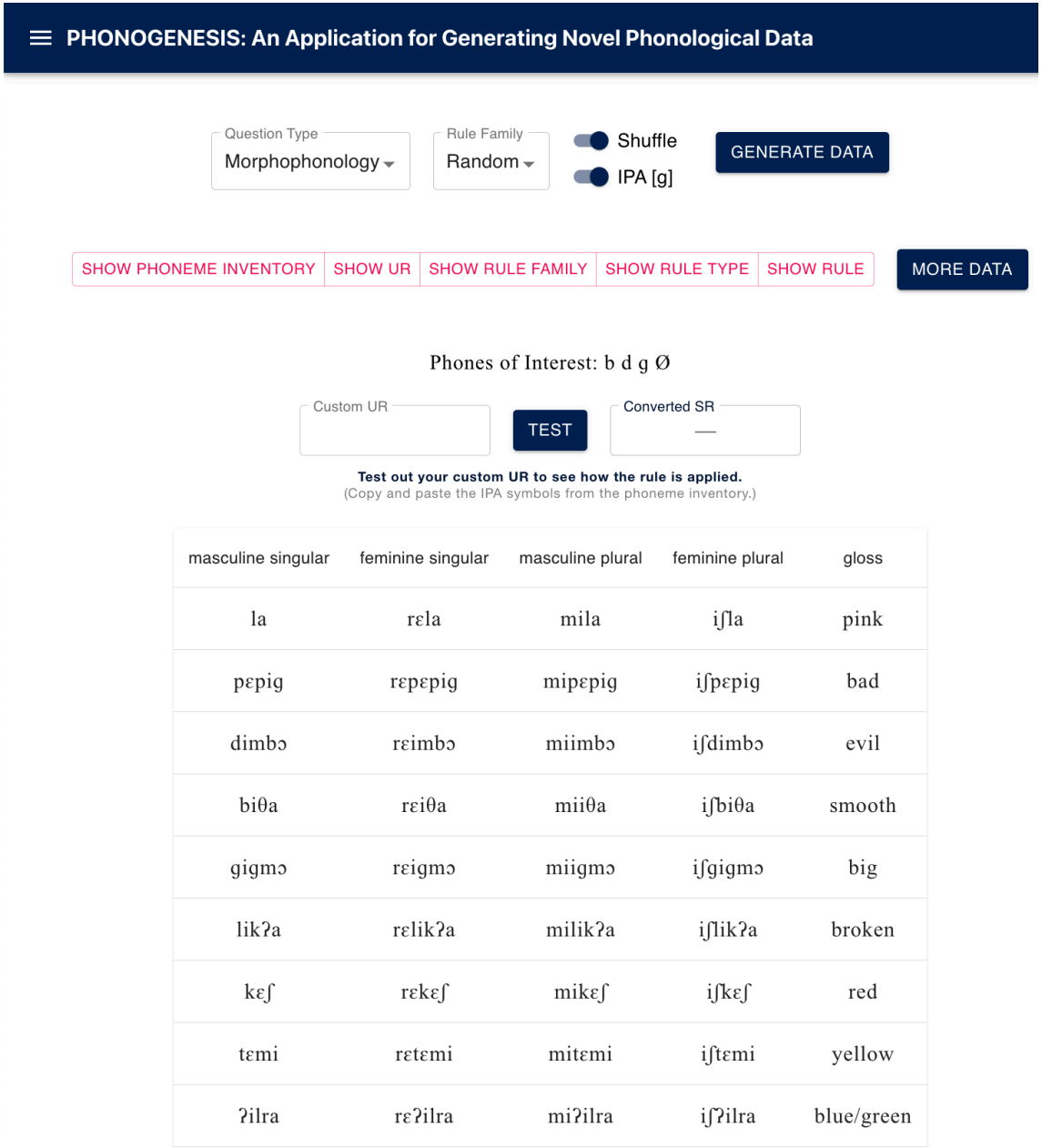
Lots of other options!

- flashcards
- Jeopardy-style quiz show
- locked questions
- bingo-card generator
- word search, crosswords, word scramble, Wordle, etc.

Flippity also has some tools for gamification, which is using elements of gaming as part of the overall classroom environment: badge trackers, leaderboards, etc. Note that this is subtly different from using full games to aid learning, though they are obviously related and may blur together.

Phonogenesis (Sanders et al. 2021–2024) is an online tool for generating novel phonology data sets, built by a team of undergraduate RAs, especially Junan Zhao and Chaerin Song.

- can be used by students to create practice problems (includes UR testing, hints, and solution)
- can be used by instructors to create homework/test problems
- lots of common rule types: lenition, final devoicing, assimilation, vowel harmony, palatal mutation, deletion, epenthesis, etc.
- various options (distributions vs. morphophonological alternations, rule type selection, shuffled data, etc.)
- includes filler words invisible to the rule (i.e. UR = SR)
- beta version at https://phonogenesis.accelsnow.com/ is functional, but still very much in progress



masculine singular	feminine singular	masculine plural	feminine plural	gloss
la	rɛla	mila	iʃla	pink
pɛpig	rɛpɛpig	mipɛpig	iʃpɛpig	bad
dimbɔ	rɛimbɔ	miimbɔ	iʃdimbɔ	evil
biθa	rɛiθa	miiθa	iʃbiθa	smooth
gigmɔ	rɛigmɔ	miigmɔ	iʃgigmɔ	big
likʔa	rɛlikʔa	milikʔa	iʃlikʔa	broken
kɛʃ	rɛkɛʃ	mikɛʃ	iʃkɛʃ	red
tɛmi	rɛtɛmi	mitɛmi	iʃtɛmi	yellow
ʔilra	rɛʔilra	miʔilra	iʃʔilra	blue/green

Wrap-up

Wrap-up

I’ve given you a broad scattershot of ideas. I hope some of them stick, or at least, inspire you in your own teaching in some way.

I’ve been teaching for 30 years, and I still find ways to improve! Some of it is easy, some of it is harder.

It’s worth the effort.

Thank you!

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