

“P” to the Candle

A LANGUAGE GAME

If you have ever *blown out* the candles on a cake, you know that the air coming out of your lungs and mouth can change the flame.

But have you ever observed what happens when you *talk* into a candle?



In these games you will be talking into a tea light. As you have fun moving the flame with the sounds “a”, “m”, and “p”, you will also learn how air flows when you talk.

Do you want to know more before you start playing the games? Go straight to The Science on the next page!

THE GAMES

All games are played with a candle and parental discretion is advised!

To play these games, you’ll need:

- Safety first: parental supervision
 - Table in a draught-free space
 - Ruler
 - Tealight* and lighter
- *Tealights work well because they are low and have a thin pit.

All games start with this preparation:

1. Rest your chin on the table edge;
2. Place the tealight on the table, 15cm from your mouth;
3. Ask an adult to light the tealight.

1. SOUNDS MOVE THE FLAME

1 or more players; in person

Say the sounds and look at the flame. How does the flame change?

1. “aaah”. The flame probably stays still.
2. “mama”. The flame might flicker a bit.
3. “papa”. The flame might move a lot.

If you play with more than one person: Whose “p’s” make the flame flicker most?

2. FLAME-READING

2 players; in person or online

1. Player 1 sits ready with the tealight
2. Player 2 takes a seat opposite Player 1
3. Player 2 closes their ears or puts on headphones with music (not too loud!)
4. Player 1 says “mamama” or “papapa”
5. Player 2 tries to guess what Player 1 is saying by only looking at the candle!

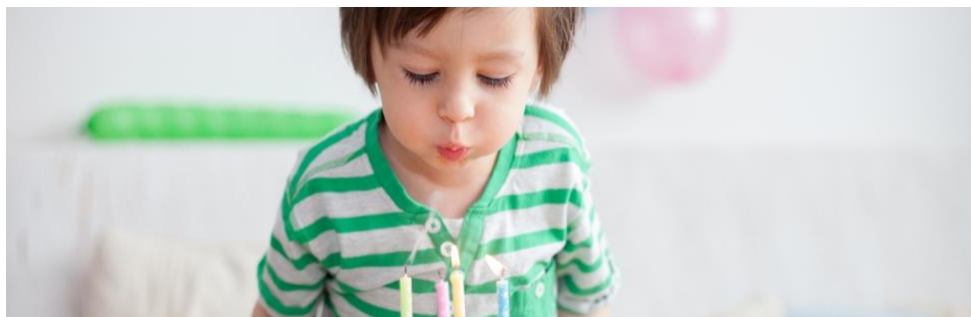
Online adaptation:

- Call Player 2 on a video call
- Show Player 2 the candle and face of Player 1, but mute the sound
- Can Player 2 guess if Player 1 is saying “mama” or “papapa”?

3. P-ING OUT THE CANDLE

2 or more players; in person

1. Say “p” (“puh”) with the biggest puff of air.
2. Can you put out the flame just by saying “p”?
3. How far away can you move the tealight and still put out the flame just by saying “p”?



THE SCIENCE

If you've ever blown out candles on a birthday cake, you know that a gentle blow isn't enough. You need to blow hard to blow out candles! But why do some *speech sounds* move the flame more than others?

The answer can be found in the way that air flows when you talk. Most speech sounds are said with air flowing out of your lungs and throat, through your mouth or nose, into the open. If the air flows out gently, it doesn't affect a flame much. If the air flows out quickly, speech sounds can cause a flicker to a flame, or even blow it out!

Air flows gently out of your mouth when you say "ah". Air cannot come out of your mouth when you say "mm", but will gently flow out of your nose! The gentle flow for "ah", "mm", and their combination "mama" doesn't move a flame much.

From the candle games, you may have guessed that air flows out much faster when you say "p" ("puh"). But why? "p" is similar to "m" as your closed lips stop air coming out of your mouth. But they are different because in "p", your closed velum (at the back of the roof of your mouth) stops the air coming out of your nose! For "p", the air thus builds up in your mouth and when you open your lips, all the collected air comes out in one fast puff. This puff can move the flame: saying "papa" can cause flickering and an effortful "p" ("puh") may even blow out the flame!

Speech researchers Conor Mayer, Bryan Gick and colleagues were curious whether listeners would use the flickering candle to decide what they hear. They made a video of a lady saying words with a candle in front of her. Of course, the candle flickered for words starting with "p". The researchers then made mismatch-videos, showing the candle-flicker of "p" and with the sound "b". What did they find? If listeners saw the candle flicker, they were more likely to say they heard "p". This shows that what we hear can be influenced by what we see!

CAN YOU SHARE THE FUN?

The Child Language Lab would love to hear or see examples of your family playing one of these games. If you'd like, you can record it and share on the Child Language Lab Facebook page:

www.facebook.com/CLLMQ

There you can also see examples of Child Language Lab members having a go at these games!

MEET THE TEAM!

These games were developed by [Titia Benders](#), deputy-director of the [Child Language Lab](#). The science was double-checked by Rosanne Abrahamse. Her PhD research in the Child Language Lab investigates how children with hearing loss [perceive very small differences between words](#) such as "beach" and "peach". Leanne Trinh, a third-year student in the [Bachelor of Speech, Hearing and Language Sciences](#) who is completing an internship in the lab, chose the pictures and fixed the layout. They hope you enjoy the result!

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MACQUARIE
University



The Child Language Lab studies the process of child language acquisition. Our goal is to understand the nature of language development in children in order to inform theories of language acquisition and more targeted language therapies, providing an evidence base for health and education policy.

POPULATIONS: Our research group studies language development in infants, monolingual and bilingual children, children with hearing loss and children with language delay.

TOPICS: We focus primarily on issues at the phonetics/phonology/morphology interface, including the acquisition of grammatical morphology and language processing more generally.

METHODS: We do our research with specifically designed tasks to gather behavioural and neurological evidence of children's developing language abilities in both comprehension and production. Our methods include: behavioural speech perception and production tasks, eye-tracking, EEG/MEG (KIT-Macquarie Brain Research (MEG) Laboratory), various standardised tests of language, working memory, cognition and executive function

MAIN RESEARCH AREAS:

- **Hearing loss:** What are the challenges faced by children with hearing loss when it comes to language, communication and listening effort?
- **Bilingualism:** How do bilingual or second language learners acquire language? What are their unique strengths and challenges in language processing?
- **Production/speech planning:** What are the factors that determine how children produce sounds, words, morphemes, prosody and sentences, and how does this change over time?
- **Perception/comprehension/processing:** When are children able to recognize sounds, words and morphemes, and predict what's coming next in the sentence?

FIND OUT MORE:

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