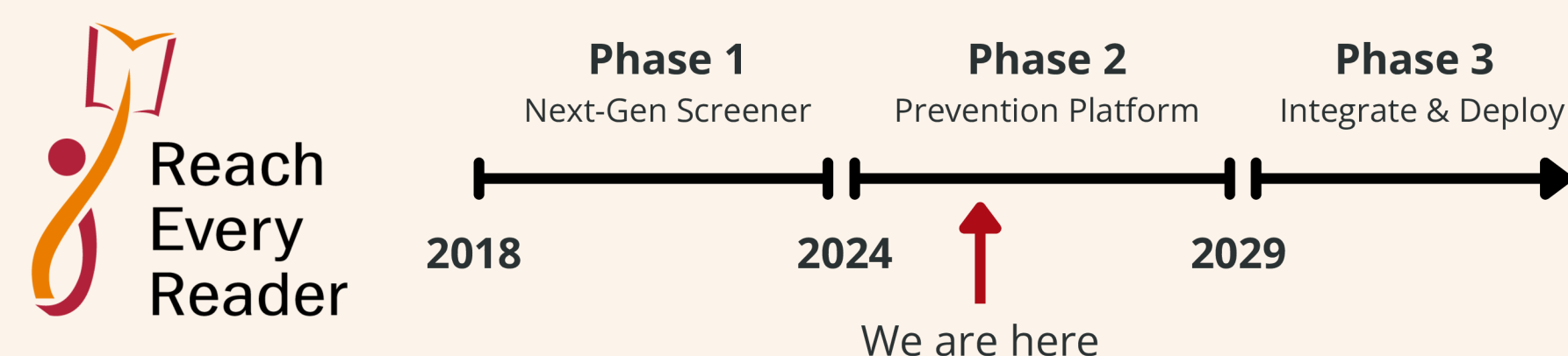


**Goal:** Explore **safe & effective** uses of cutting-edge technology for assisting **early literacy educators**.



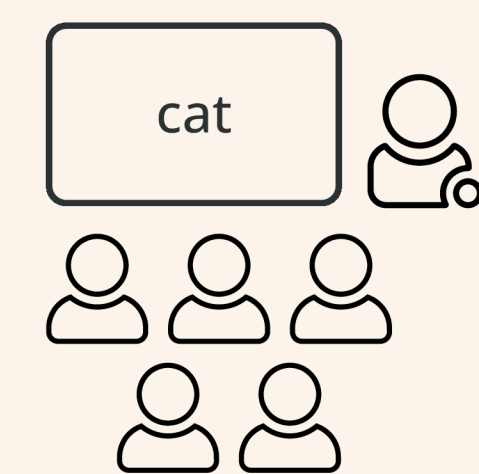
Reach Every Reader leads 4 studies spanning all aspects of a child's early literacy education: **assessment, instruction & AI, pediatrics, and social work.**

**31%** of U.S. 4<sup>th</sup> grade students read at grade level.  
Reach Every Reader's vision is that **100%** of children will be reading at or above grade level.

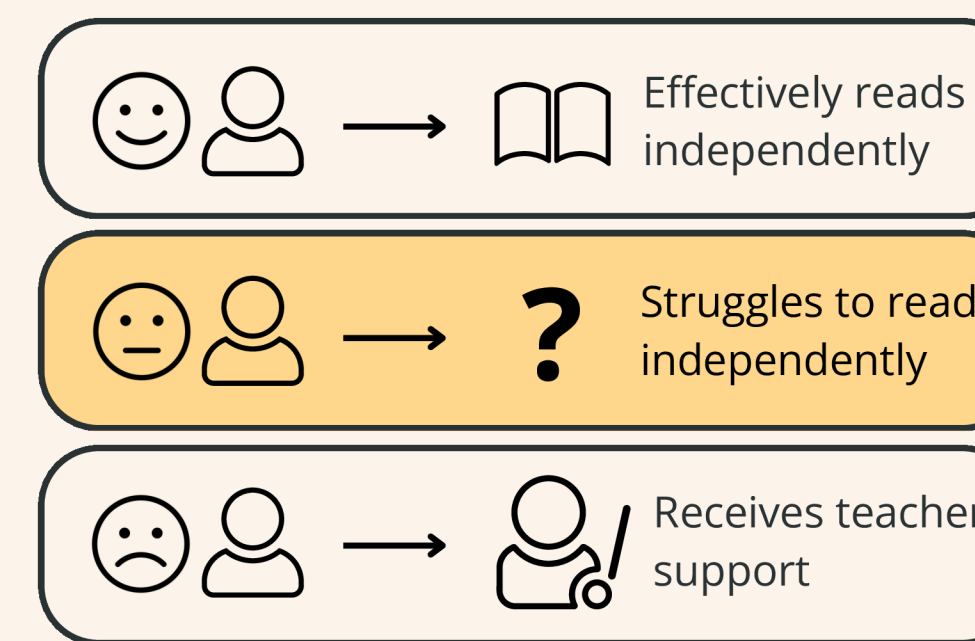


## Learning Games

Classes learn new words as full class...



...then move to independent reading/activity time



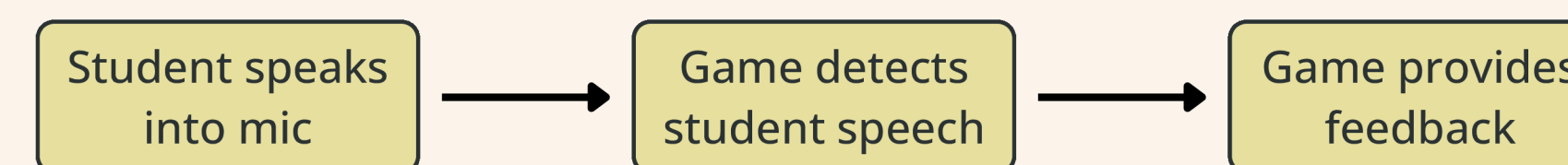
Students at different reading levels will experience independent reading time differently

Teaching teams lack the bandwidth to help every student, learning games can fill that gap

**Identified as area for technology to enhance**

These games aim to support **individualized practice** in the same way a teacher would by recommending catered activities that teachers approve.

These learning games require reliable **speech recognition technology** to detect what students read in order to provide meaningful feedback. We explored the limitations of existing speech recognition tools.



## Teacher Data Dashboard

**Goal:** Help inform how early literacy educators plan lessons for students based on assessment.

### Problem

Teachers lack actionable feedback about each student's progress. Existing **progress monitoring dashboards** are not effective, so teachers make their own with spreadsheets. Many pain points still exist with their spreadsheets, despite being preferable to existing tools.

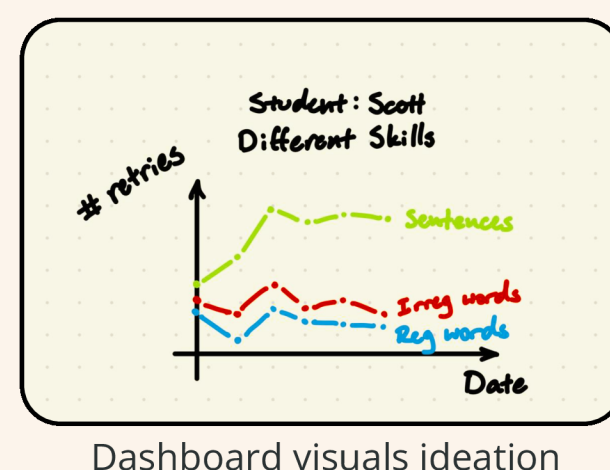
**"If a teacher can't use the dashboard effectively during their five minute break, it isn't useful"**

- Julianne Masser, School Psychologist

### Dashboard Insights

A co-design focus group was run with four experienced educators, yielding insights:

- Teachers need **visuals**
- Experienced teachers already know what's wrong, could dashboard **focus on positives?**
- Teachers are willing to listen to a **chatbot**



Dashboard visuals ideation

### Next Steps

Continue to **co-design**, verifying and generating new insights with a broader population of teachers.

## Ethical Considerations

### Privacy

When working with children, the top ethical priority is protecting their privacy. At the testing stage this means ensuring no voice data from trials is stored, any testing data is not stored in company-controlled cloud services, and everyone involved in the project signs a detailed data-sharing agreement that protects personally identifiable information. As the tech and AI specific climate is rapidly changing, any agreements and privacy infrastructure should be reviewed semi-annually to ensure up to date standards.

### Cooperation

Ethical cooperation between developers, designers, maintainers, and users is essential for a safe and effective product. Cooperation between these parties limits the risk of anyone working outside their field of competency while allowing for a deeper and broader understanding of relevant technical and social aspects of the project.

### AI

**Trust** - One consideration with AI is ensuring its use doesn't break a family's trust in the teacher. Since, if used ineffectively, AI may reduce students' learning capacity, affecting their trust in their education.

**Environment** - Another consideration is how it affects the environment and what is being done to mitigate these affects.

### Next Steps

The next steps for ethical considerations is to conduct the second round of **sustainability analysis** based on the finalized game model.

## Speech Recognition Limitations

### Individual Sounds

**Individual sounds** are the foundational building blocks of learning how to read. However, current speech recognition is built to recognize full words, and struggles to detect individual sounds.



Various companies are developing technology to detect individual sounds, however it is much less explored than the detection of full words.



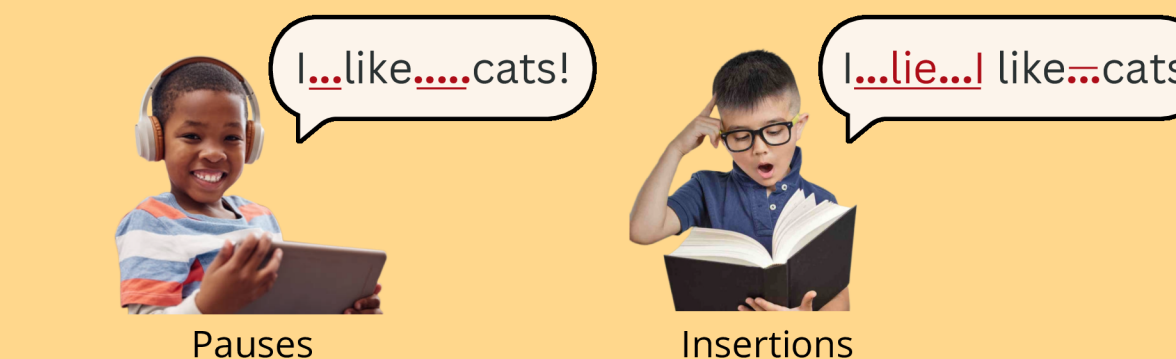
### Next Steps

Using voice data collected in phase 1, **fine-tune** one of the models in development to make a specialized model for detecting individual sounds for children's voices.

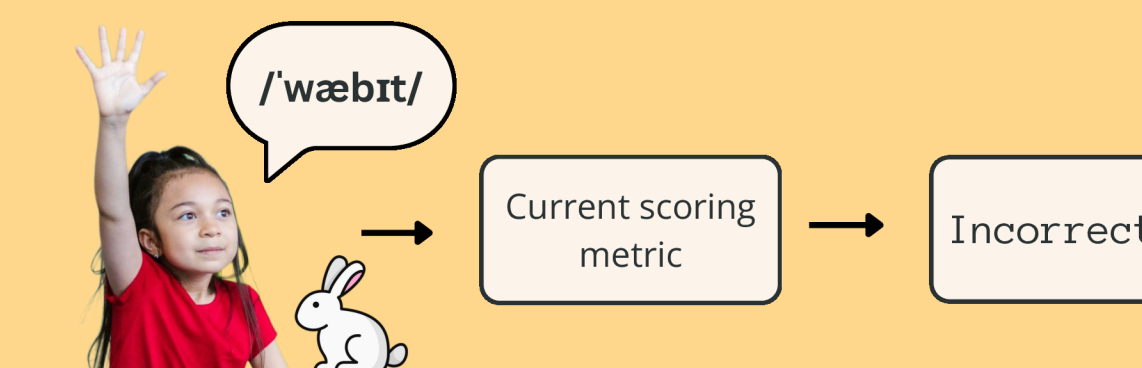
### Children's Speech

#### Pauses & Insertions

**Pauses** and **insertions** are common from early readers. However, current speech recognition doesn't account for these differences.



#### Developmental Differences



Children pronounce sounds differently during development\*. This must be taken into consideration when scoring correctness.

\*due to missing teeth and less developed muscle coordination