ZONE OF PROXIMAL DEVELOPMENT
(Cognitive Readiness)

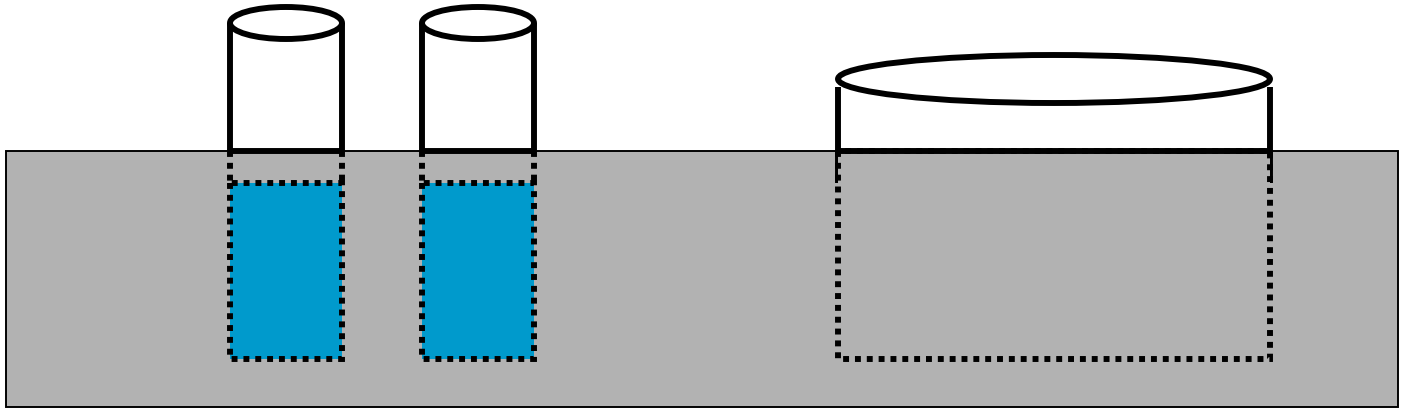
Vygotsky defines the zone of proximal development as *"the distance between the actual developmental level as determined by individual problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers."*

According to Vygotsky's view, the role of the teacher is to provide assistance to students as they engage in a cognitive task. Teaching is redefined as "assisted performance."

CLASSIC STUDY ON COGNITIVE READINESS: BRUNER'S SCREENING STUDY

<u>Participants</u>: 4 to 7 year old children who clearly failed the conservation of liquid substance task.

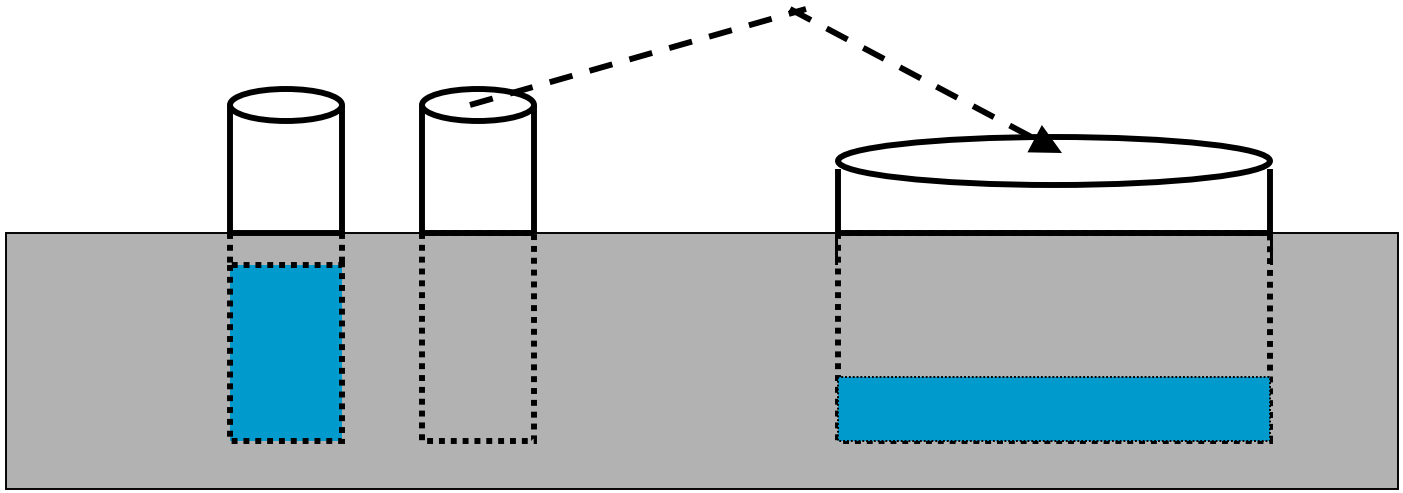
<u>Step 1</u>: Screen is placed in front of the beakers before the liquid is poured.



CLASSIC STUDY ON COGNITIVE READINESS: BRUNER'S SCREENING STUDY

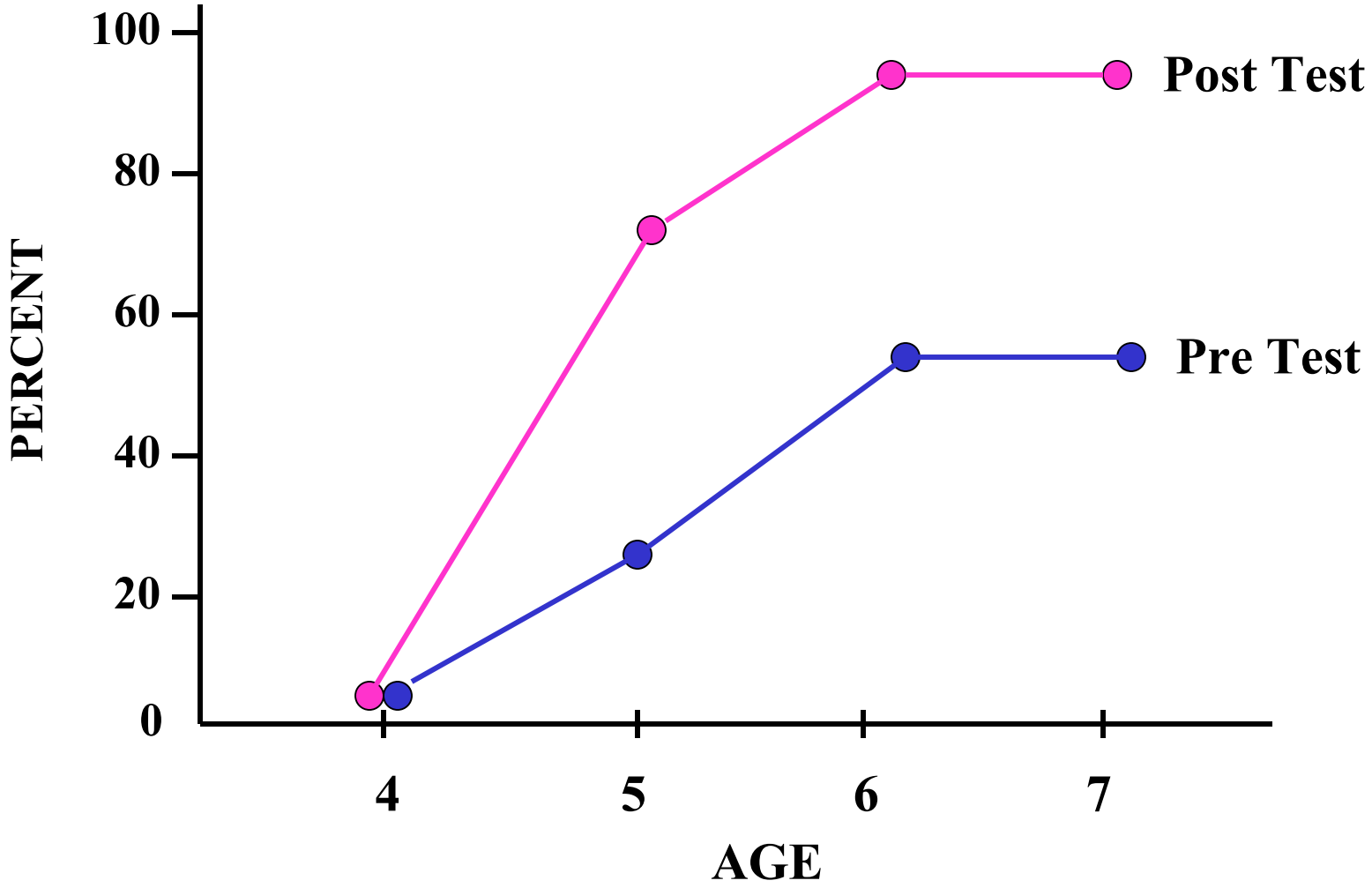
<u>Step 2</u>: Blue liquid is poured from one of the tall beakers to the wide beaker.

<u>Step 3</u>: Child is asked whether the liquid is still the same amount.



<u>Results</u>: When children do not have the misleading visual information, they say "It's the same, you only poured it"

% CHILDREN SHOWING CONSERVATION BEFORE AND AFTER SCREENING



COGNITIVE APPRENTICESHIP

The goal of cognitive apprenticeship is to help students learn the cognitive *"processes that experts use to handle complex tasks"* through guided experience on intellectual tasks.

- **relies on guided practice as an effective instructional method**
- **emphasizes learning cognitive skills**
- **takes place within a formal instructional setting - a school, a training program, a computer simulation**

METHODS OF COGNITIVE APPRENTICESHIP

Modeling
teacher describes her cognitive processes while carrying out a task

Coaching
teacher offers hints, comments & critiques to student who is carrying out a task

Scaffolding
teacher helps student complete task by performing parts student cannot do unaided

STUDIES USING RECIPROCAL TEACHING: TRAINING COMPREHENSION MONITORING

Students: **Junior high school students with reading problems**

Students Were Trained To:

- **summarize**
- **clarify**
- **predict what comes next**
- **predict what questions a teacher would ask**

Teaching Techniques:

- **reciprocal teaching**
- **explicit teaching**
- **modeling**
- **control**

Results:

- **reciprocal teaching showed the greatest gains**
- **reading comprehension scores on pre- and post-test went from 40-50% to 80%**

COOPERATIVE LEARNING

In cooperative learning small groups of students who differ in ability work together as a group on an academic task. Rather than competing, members of the group work together and are evaluated as a team.

- **groups are combinations of high and low performing students**
- **after students work together during the learning phase, they are evaluated separately**
- **their individual improvement scores are added together for a group improvement score**

COOPERATIVE LEARNING: WHY IT WORKS

The superiority of cooperative learning methods has been reported across many subject areas, types of learning materials, and ability levels of learners. The key features responsible for this success are:

- **rewards depend on group performance, each individual contributes to the overall improvement of the group**
- **individuals are expected to coordinate their efforts toward a common goal, provides a positive social context for learning**
- **heterogeneity of the group (gender, ethnic background, ability)**

PARTICIPATORY MODELING

An expert and a novice each participate in modeling the process for accomplishing some cognitive task.

For example, a novice writer can learn how to effectively plan a composition by listening to an expert writer organize his/her composition.

Three Stage Model

1) first the expert (teacher) models the strategy to be learned

2) next the novice (student) models the strategy with ongoing support from the expert (teacher)

3) the novice (student) now applies the strategy without ongoing support