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# Raising the Bar: At-Risk Prevention for Urban Students in Middle School Science and Math Classrooms

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# **Raising the Bar: At-Risk prevention for Urban Students in Math and Science Classrooms**

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Fayetteville, NC

National Youth At Risk Conference

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# Who are students at risk?

- **students** or groups of **students** who are considered to have a higher probability of failing academically or dropping out of school.

[The Glossary of Education Reform](#)

- [edglossary.org/at-risk/](http://edglossary.org/at-risk/)

Aug 29, 2013

# Purpose

- To illustrate best practices for enhancing student success in science and math classrooms.

# Reducing the risk, (Wehlage, 1989)

- (1) successful schools created a supportive environment that helped students overcome impediments to membership and engagement
- (Relationship)
- (2) impediments to engagement include absence of economic pay-off after graduation, a narrow conceptualization of learning, and a superficial curriculum
- (Engagement)
- (3) successful programs matched student needs and problems, and took advantage of student interests and strengths
- (Expression)
- (4) teachers at successful schools accept a proactive moral responsibility for educating at-risk youth
- (Representation)

# Theoretical Framework

- **At-Risk education**

- “What works for students at risk: A research synthesis”, Slavin & Madden (1989)
- “Reducing the risk: Schools as communities of support”, Wehlage (1989)
- “Student at risk”, Manning, Baruth, & Tobin (1995)
- “Impact of a Career Intervention on At-Risk Middle School Students' Career Maturity Levels, Academic Achievement, and Self-Esteem science non effective for future”, Legum, Hoare (2004)

- **Theory of third space**

- Urban Latino students, Moje (2004)
- School science curriculum and student’s personal interest, Wallace (2004)
- Role-play in Elementary schools, Cook (2005)

- **Culturally responsive pedagogy**

- Embraces diversity as a virtue, Ladson-Billings (1995)
- Evokes cultural responsiveness in all students, Irvine (2003)
- Enhance success and reduce classroom conflicts, Thomas (2006)

# Terminology:

- **Theory Third Space =**
- The area of focus for teaching that connect out of home, community, peers knowledge (**first space**)
- to school, church, work (**second space**)
- to a place where the competing knowledge and discourses are brought together (**third space**).

(Bhabha, 1989; Soja, 1989; Moje, 2004; Wallace, 2004; Cook, 2005)

# Third Space Theory



**First Space**



**Third Space**



**Second Space**

(Soja, 1989; Bhabha, 1994; Moje, 2004, Wallace, 2004; Cook, 2005)

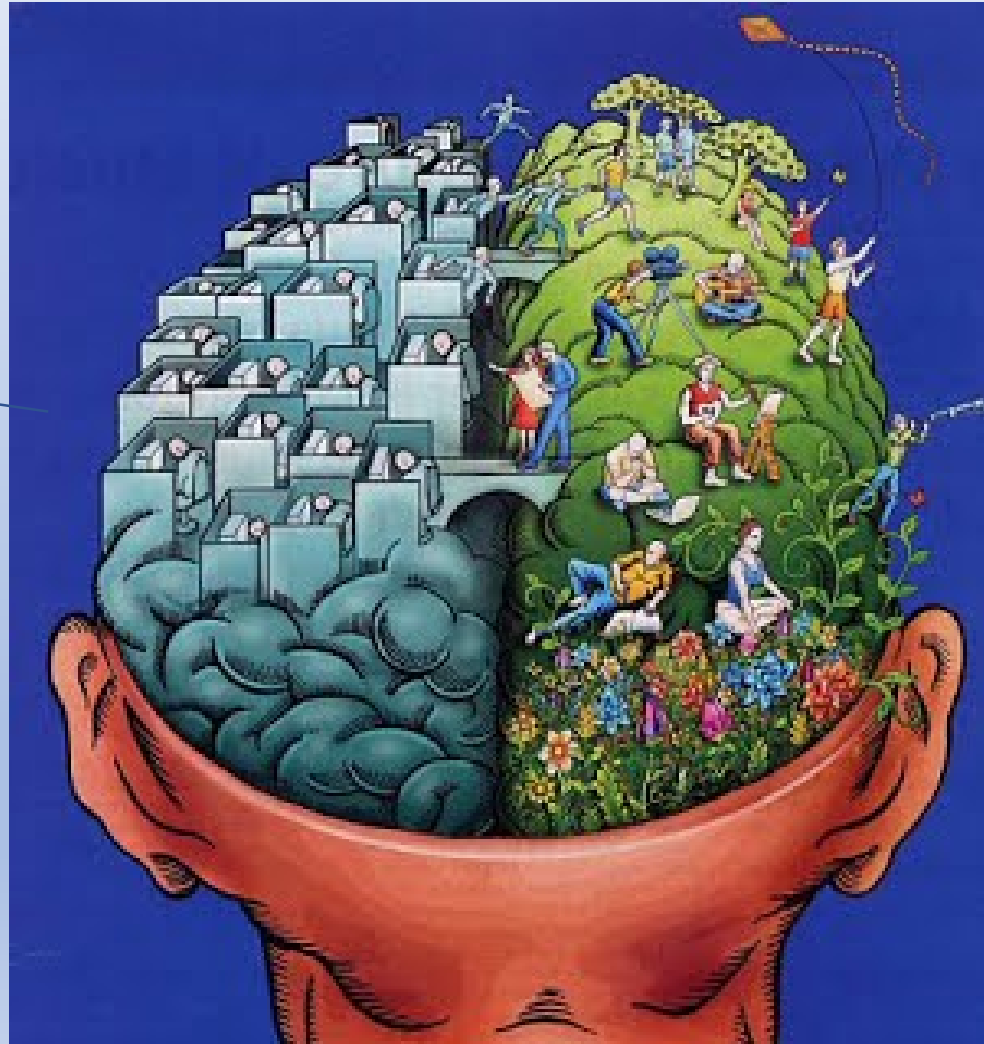


# Hybridized knowledge

2<sup>nd</sup> Space

1<sup>st</sup> Space

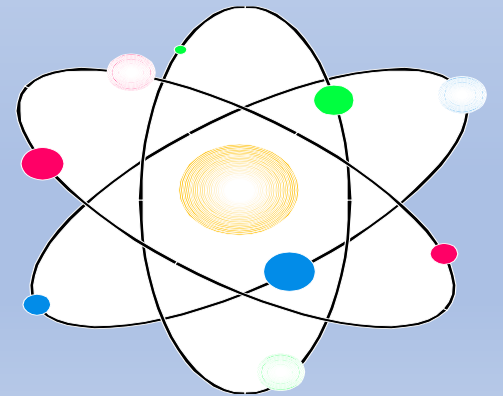
3<sup>rd</sup> Space



Wallace, 2004

# Science

- *Theory of third space is used to explore inquiry-based classroom engagement as a means of ensuring continuity between prior knowledge and experiences and the standardized school curriculum.*



# Inclusion

- **Science inquiry**

requires students to do authentic investigations of their choice.

- **Whole Group Projects**

- Design a garden (vegetable/flower) on campus
- Design a culminating activity following a class project



# Engagement

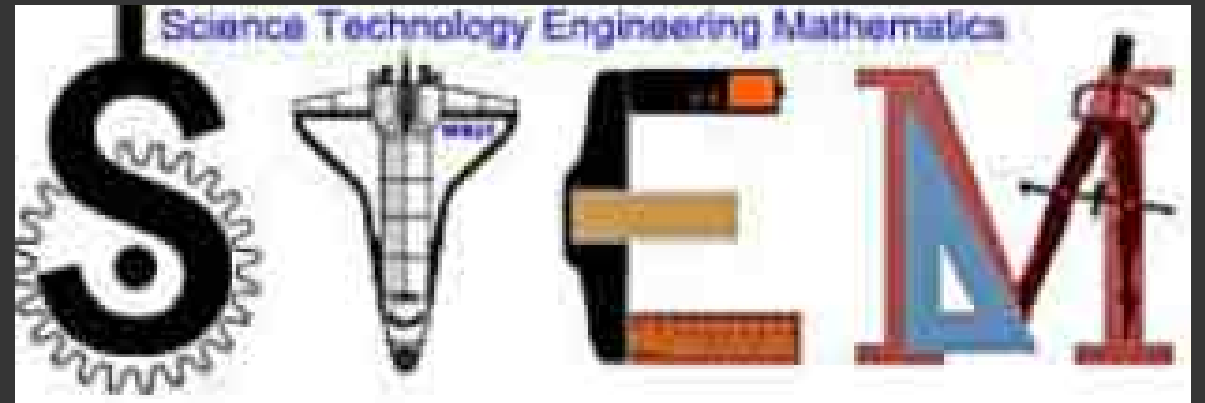
## Lab Work

- Making Silly Putty
- DNA distraction from Strawberry
- Bubble experimentation



# Expression

- Individual Projects
  - Science project
  - Science fair
  - PBL
  - STEM



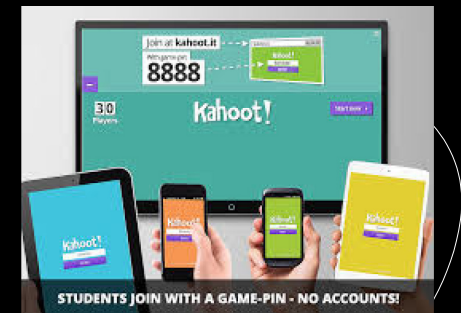
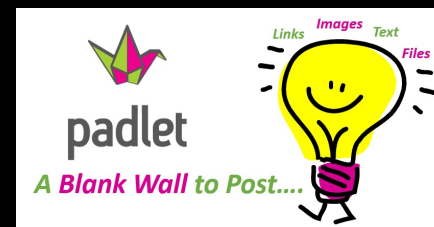
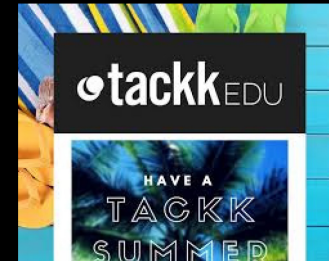
# Representation

## • Use Web-based Apps

- Glogster
- Steller
- iMovie
- Padlet



Glogster  
poster yourself  
EDU



# Multiple Means of Representation



## Ratios & Proportions

- *Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.*
- *Explain A part to part ratio and a part to whole ratio*
- *For example, “The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak.”*
- *“For every vote candidate A received, candidate C received nearly three votes.”*

# Multiple Means of Expression



## Ratio & Proportion Feedback

Made with serendipity

 Tanya Hudson • 4m

Please Read the question carefully, write an answer and an explanation how you came up with your answer .

If the number of guppies is represented by black circles and the number of goldfish is represented by white circles, how can this ratio be modeled?

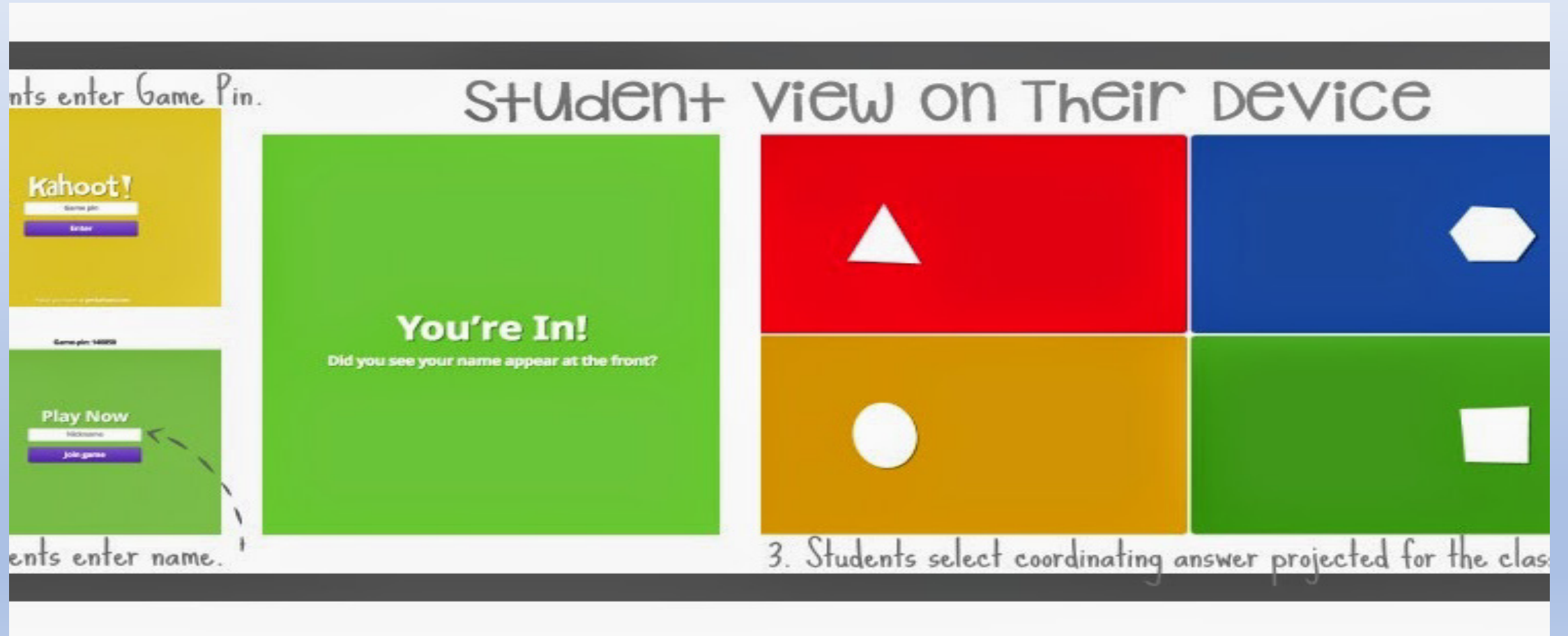




# Multiple Means of Engagement

Students enter Game Pin.

Student View on Their Device



The collage includes:

- A yellow Kahoot! login screen with a 'Game pin' input field and a 'Join' button.
- A green screen with the text 'You're In!' and 'Did you see your name appear at the front?'.
- A green screen with a 'Play Now' button and a 'Join game' button, with a dashed arrow pointing to the 'Join game' button.
- A 2x2 grid of colored squares with geometric shapes:
  - Top-left: Red square with a white triangle.
  - Top-right: Blue square with a white hexagon.
  - Bottom-left: Orange square with a white circle.
  - Bottom-right: Green square with a white square.

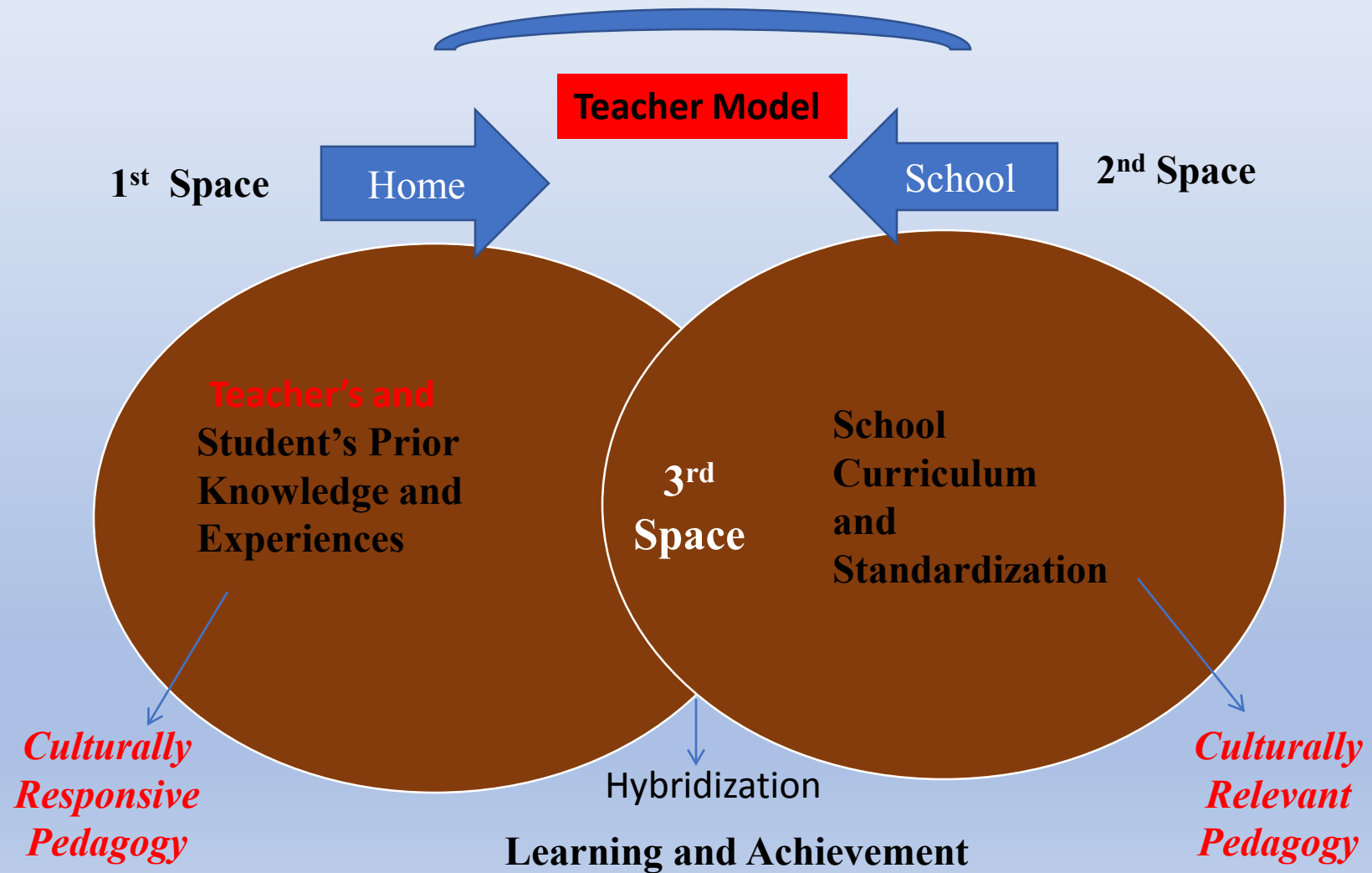
Students enter name.

3. Students select coordinating answer projected for the class.

# Science & Math Centers

- 1. Prior Knowledge (1<sup>st</sup> Space)
- 2. Content Knowledge (2<sup>nd</sup> Space)
- 3. Hybridized Knowledge (3<sup>rd</sup> Space)

# Theory of Third Space



**The End!**