Putting Student Thinking at the Center of Instruction: 3 Shifts for Teaching and Leading Mathematics

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Complete this task as we are getting started

One-half of a flag is one color and the other half is another color. Draw what the flag might look like.

Draw at least 5 examples. Explain how you know they show one half.

Think about how a third grader might solve this task.

-this task is part of the Fairfax County Public Schools library of problem-based assessments

Session Description

Putting Student Thinking at the Center of Instruction: 3 Shifts for Teaching and Leading Mathematics

Assessment practices often reflect a deficit view of students, focusing on what they do NOT know. This session introduces three shifts in assessment practice that instead focus on what students DO know. The Student Work Clinic, used alone or within a collaborative team, features strategies for using work samples to guide assessment and instruction.

Please introduce yourself to someone new at your table

Raise your hand if you are:

- An elementary teacher
- A secondary teacher
- A school-based math coach
- A district office math specialist
- An administrator
- A teacher educator
- Other??

https://www.showme.com/sh/?h=VkiN77g

Please introduce yourself to someone new at your table

State your name, your school division, your student population, and why you are in this session.

Session Goals

- Define *asset-based* and *deficit-based* assessment
- Recognize some harm caused by deficit views of learners
- Identify deficit-based language
- Try out strategies for asset-based language in assessment
- Discuss Student Work Clinic

The Deficit Paradigm

In education, the deficit model "sees kids as lacking in some way, defective, needing to be fixed"

May 16, basdenleco, & Am, 2016 at 7:08. (2016, May 8). Approaching Marginalized Populations from an Asset Rather Than a Deficit Model of Education. Retrieved March 7, 2019, from https://usergeneratededucation.wordpress.com/2016/05/08/approaching-marginalized-populations-from-an-asset-rather-than-a-deficit-model/

The Asset Paradigm

The asset model starts with the idea that students from marginalized groups have "unique strengths, passions and interests," and typically have "much to offer" both individually and collectively—especially when it comes to teaching others about their communities.

May 16, basdenleco, & Am, 2016 at 7:08. (2016, May 8). Approaching Marginalized Populations from an Asset Rather Than a Deficit Model of Education. Retrieved March 7, 2019, from https://usergeneratededucation.wordpress.com/2016/05/08/approaching-marginalized-populations-from-an-asset-rather-than-a-deficit-model/

Deficit-Oriented Language

1966 Study defined language of Black boy as “deficit“ (Bereiter & Engelmann, p.341)

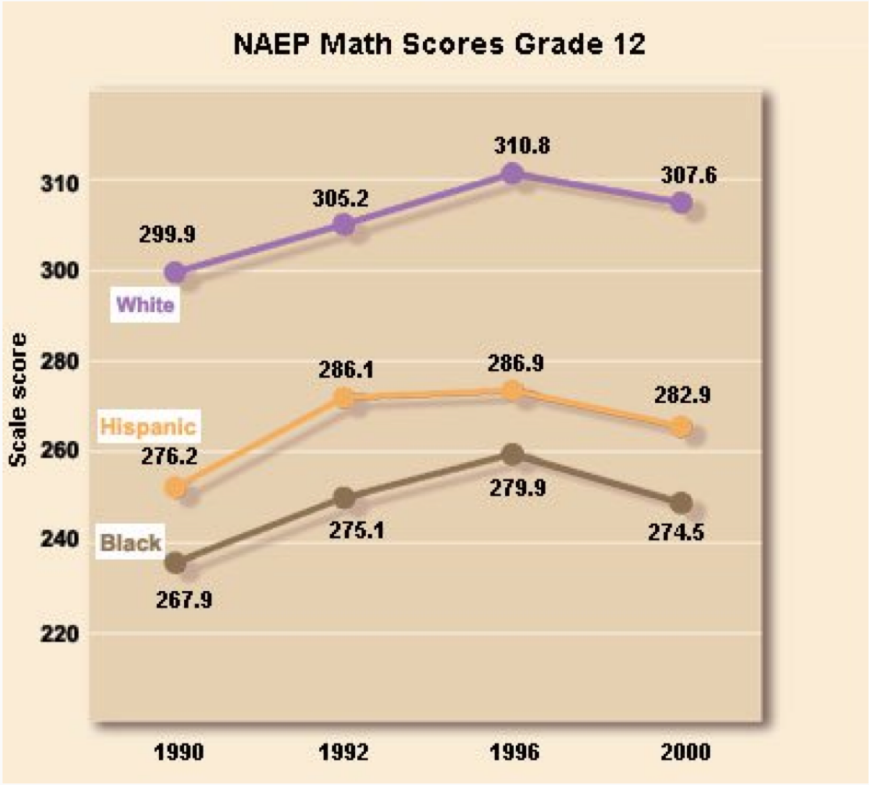
Instead of saying “He’s a big dog,” the deprived child says “He bih daw.” Instead of saying “I ain’t got no juice,” he says “Uai-ga-na-ju.” Instead of saying “That is a red truck,” he says “Da-re-truh.”

1970 Demonstration by a linguist (Labov) redefined “deficit“ as “different“

“…cultural deprivation represents a special case of cultural difference that arises when an individual is faced with demands to perform in a manner inconsistent with his past (cultural) experience“ (Cole & Bruner, 1971, p. 874).

“The Achievement Gap”

- The achievement gap takes as “normal” the white dominant culture.
- The dominant culture sets the bar for what qualifies as “successful.”
- The achievement gap favors the dominant culture and frames others as “deficit,” ignoring strengths



https://www.edweek.org/ew/articles/2005/03/23/28math-s1.h24.html

For more information, see Ansell, S. (2011, July 7). Achievement Gap. *Education Week.* Retrieved Month Day, Year from http://www.edweek.org/ew/issues/achievement-gap/

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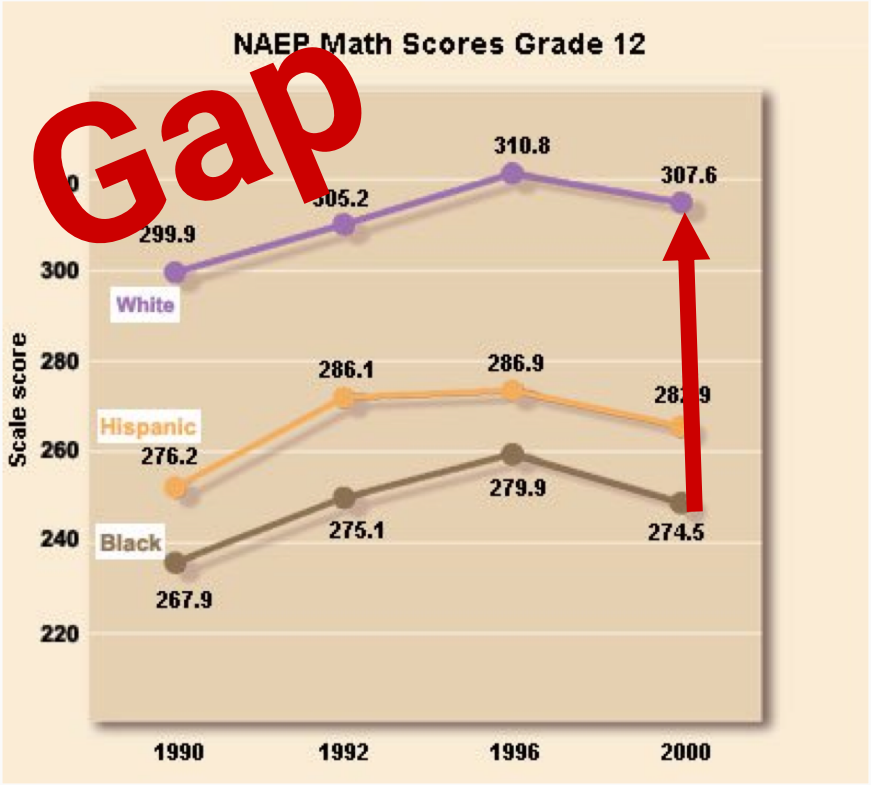
Opportunity Gap



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The Student Work Clinic

- Begins with a mathematical goal
- Includes a rich task, of high cognitive demand
- Elicits and cites evidence of student thinking
- References learning trajectories
- Plans a formative response

The Student Work Clinic

- Begins with a mathematical goal
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- **Elicits and uses evidence of student thinking**
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What are the big mathematical ideas in the Flag task?

One-half of a flag is one color and the other half is another color. Draw what the flag might look like.

Draw at least 5 examples. Explain how you know.

Three Shifts

Elicit and Use Evidence of Student Thinking

"find the mathematics in students' comments and actions"

- *Principles of Actions, p. 56*

Elicit and use evidence of student thinking. Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

3 Approaches to Looking at Student Work

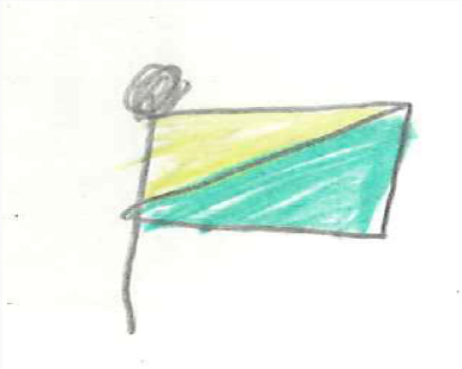
- Descriptive
- Interpretive
- Evaluative

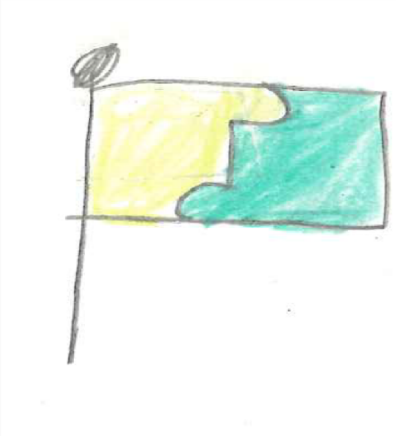
Descriptive Approach

Carries no judgment and is very literal

“I see _____ .“

“Athena showed one half with both a line of symmetry and by taking equal ‘cut outs’ from both sides of the line of symmetry ”





“I wrote it like this because no matter what you draw, if it’s equal on both sides then it is a half.”

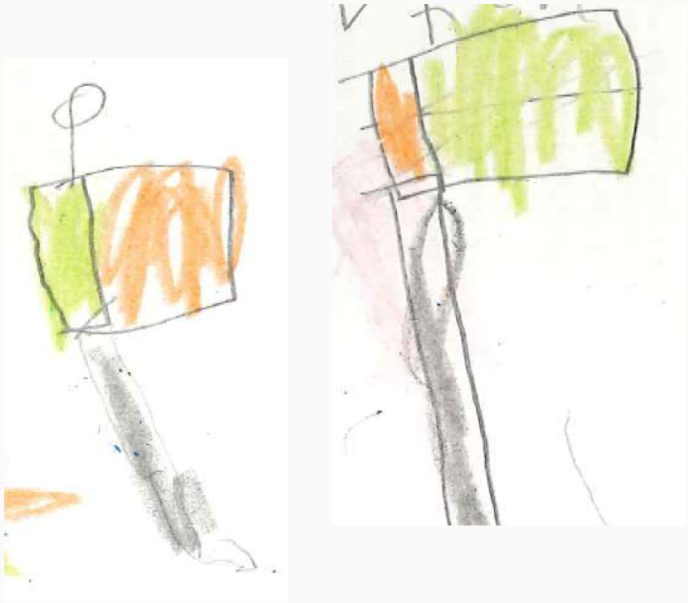
(Blythe, Allen & Powell; 2008)

Interpretive Approach

- Suggests a meaning
- Makes inferences about student thinking

"All of the evidence I have seen makes me believe _____ "

"Miguel believes that making ½ means to use two colors."



"Half is half a whole"

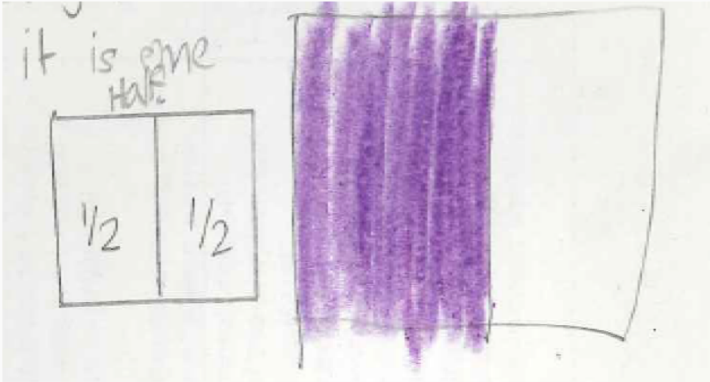
(Blythe, Allen & Powell; 2008)

Evaluative Approach

- Judgment of right/wrong, good/bad
- Impossible for everyone to make the same evaluation

"I judge this to be _____ ."

"Eddie did well on this assessment."



"I know that it is one half (be)cause when something is divided into two equal parts it is one half."

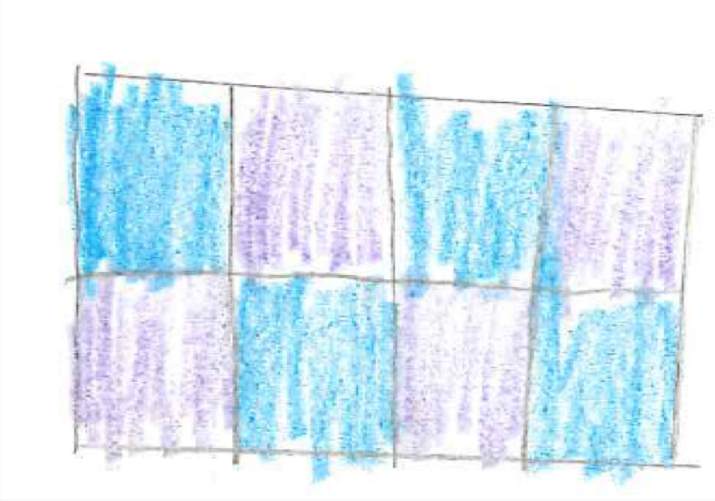
(Blythe, Allen & Powell; 2008)

Evaluative Approach

Eddie said:

"I know that it is one half cause when something is divided into two equal parts it is one half."

Would Eddie accept this as one half?



(Blythe, Allen & Powell; 2008)

What to Say Instead of an Evaluation

Try saying...

- "I see that she has written _____ ."
- "He drew three examples of _____."
- "Her model looks like what happened in the problem."

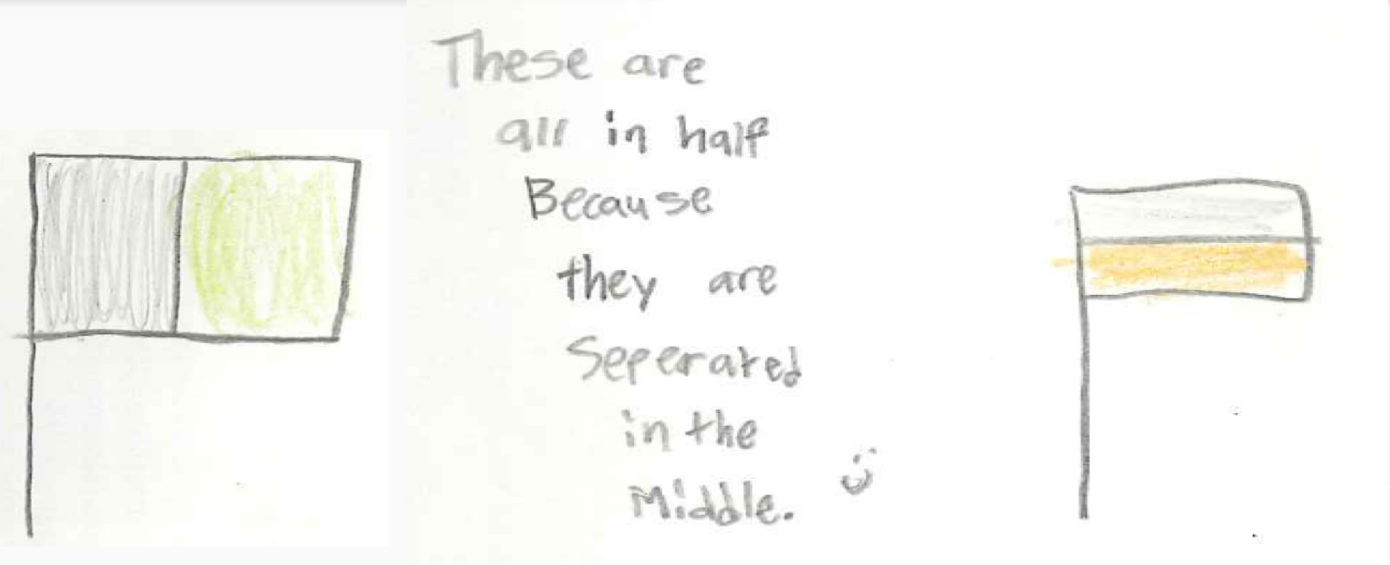
Don't say:

- "This is a good paper."
- "She can't _____."
- "He doesn't get it."

Looking for Evidence of Student Thinking in their Work

Comment	Evidence?	Judgment?
"She doesn't know how to spell."		
"The right answer is on the paper. There is no other work on this student's paper."		
"I mean, she already knows what ½ is."		

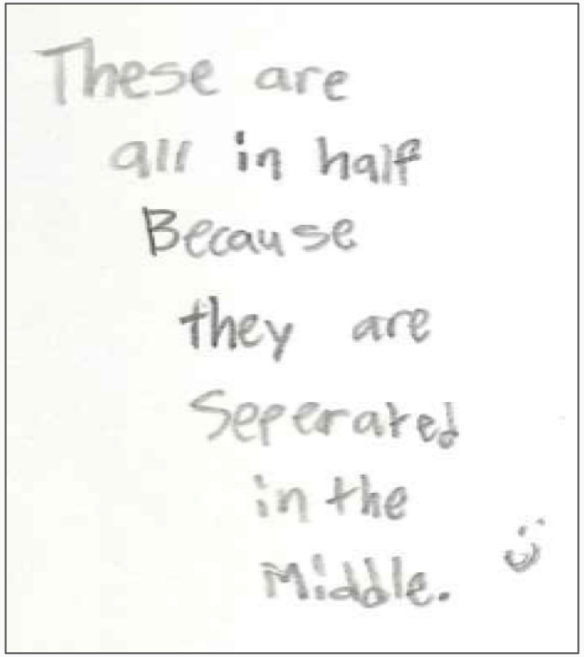
Looking at a Work Sample (try it first)



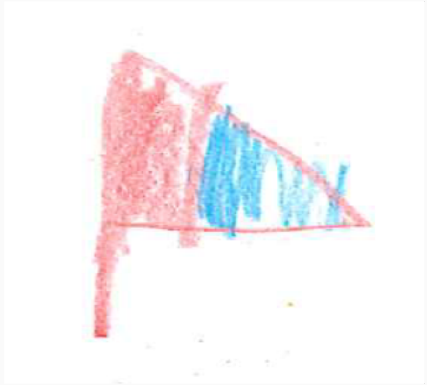
Judgment Statement	Rewrite this judgment to describe
“ Susanna totally gets it.”	
“She understands what one half is.”	

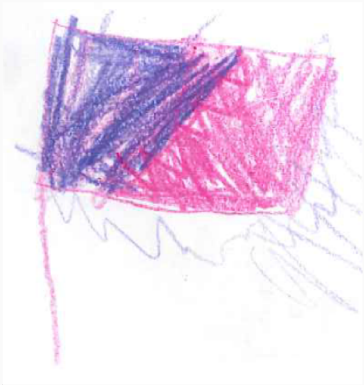
Looking at a Work Sample (try it first)

Susanna said:



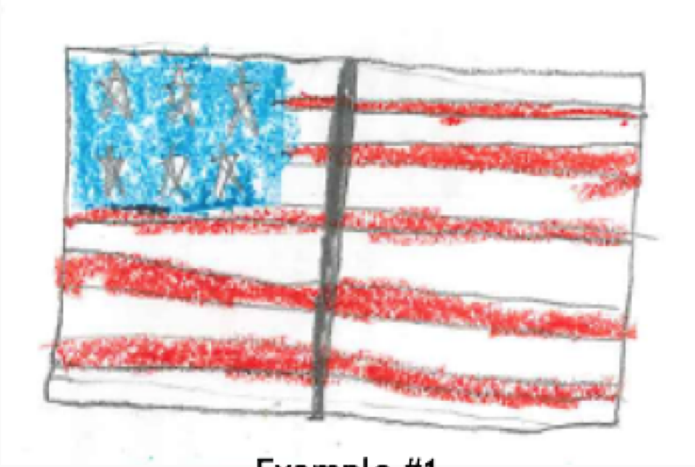
Would she accept these as one half?





Name What's Right

Look for what's right in student work.



Example #1

Example #2

Focus on What's *Right!*

Avoid negative phrases like

- "He can't…"
- "She doesn't understand…"
- "He didn't…"

Instead, say

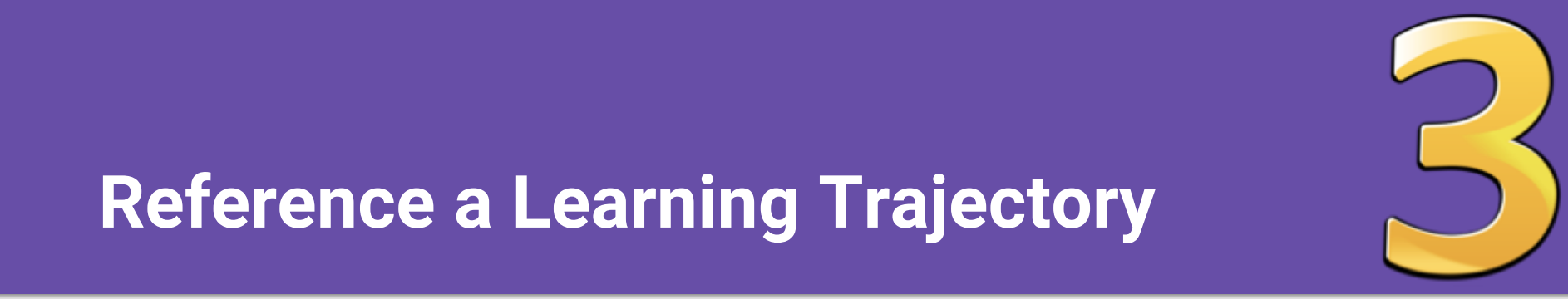
- "She drew a __, which might show that __"
- "He did _____ here."
- "There is evidence she understands…"

What’s Right about This?

Reference a Learning Trajectory

What learning comes before the Flag task and what comes after?

Reference a Learning Trajectory



The importance of specifying the whole

Without specifying the whole it is not reasonable to ask what fraction is represented by the shaded area. If the left square is the whole, the shaded area represents the fraction $\frac{3}{2}$; if the entire rectangle is the whole, the shaded area represents $\frac{3}{4}$.

4.G.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry

Area representations of $\frac{1}{4}$

In each representation the square is the whole. The two squares on the left are divided into four parts that have the same size and shape, and so the same area. In the three squares on the right, the shaded area is $\frac{1}{4}$ of the whole area, even though it is not easily seen as one part in a division of the square into four parts of the same shape and size.

Learning Progressions Documents: http:/

content/uploads/2011/08/ccss_progression_nf_35_2013_09_19.pdf

Diving in to Work Samples

Examine work samples for evidence of student thinking

- **Describe** what you see
- Compare to learning trajectory
- Avoid **Inferences** and **Evaluations**
- Pick one sample to share.
- Use a sticky note to record

Ask: **What is *RIGHT* about this work?**

The Student Work Clinic
Goal: Asset-based Assessment

- Begins with a mathematical goal
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Wrapping it Up

1. How did your discussion change by focusing on what's ***right*** in student thinking?

2. How did your language change when you cited ***evidence*** and did not judge the work?

3. How can asset-based language challenge deficit thinking?

4. What is your take-away for this session?

References and Where to Read More

May 16, basdenleco, & Am, 2016 at 7:08. (2016, May 8). Approaching Marginalized Populations from an Asset Rather Than a Deficit Model of Education. Retrieved March 7, 2019, from https://usergeneratededucation.wordpress.com/2016/05/08/approaching-marginalized-populations-from-an-asset-rather-than-a-deficit-model/

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