

## **Knowing What Students Know and Using It**

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### **What is Formative Assessment?**

- \* A process used by teachers and students during instruction that provides feedback to adjust ongoing teaching and learning to improve students' achievement of intended instructional outcomes. (Council of Chief State School Officers)

### **Formative Assessment Process**

- Learning Goals and a description of success – A description of learning the teacher intends to happen and what it looks like, in detail
- Eliciting and Interpreting Evidence – Gathering evidence of student thinking and student skill and interpreting it against the description of success to determine the next instructional steps
- Feedback – Feedback is provided with the specific intent of moving student learning forward
- Student Ownership and Involvement – Strategies to provide students with the skills they need to become self-regulated learners

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### An Example

- \* Learning goal – write polynomial expressions in equivalent forms
- \* Expand the following expressions:
  - a)  $3(x-5)^2$
  - b)  $(x-4)(x+3)$
  - c)  $2(x+1)(x+5)$
  - d)  $(x+2)(x+7)$
- \* What mathematical knowledge and skills would it take for students to be successful with these problems?

### Preliminary description of success

- \* Appropriately use the distributive property
- \* Accurate arithmetic
- \* Ability to provide evidence for equality of expressions
- \* Appropriate use of variables in algebraic expressions
- \* Accurate and precise use of variable notation in algebraic expressions

### Student work

- \* Expand the following expressions:
  - a)  $3(x-5)^2=9x^2-90x+225$
  - b)  $(x-4)(x+3)=x^2-x-12$
  - c)  $2(x+1)(x+5)=4x^2+24x+20$
  - d)  $(x+2)(x+7)=x^2+9x+14$
- \* Gaps appear to be around the distributive property.

### Next instructional moves

### What are the next two problems you would ask?

- \* Possible options
  - \*  $5(x+2)^2$
  - \*  $\frac{(5x-7)(2x+5)}{5}$
  - \*  $4(x-1)(x+1)$
- \* Note, these problems are typical textbook problems. Again, formative assessment is about the process of gathering and interpreting evidence for teaching and learning, not the form of the assessment items. The assessment has to elicit interpretable information

### Summary

- \* Knowing what students know includes being clear about the learning goal and the description of full success
  - \* Design a task that will elicit information that the teacher and student can interpret
  - \* Interpret student learning and assess any gaps between interpreted student knowledge and the learning goal and description of success
- \* Use the interpretation to inform next instructional moves and next formative assessment items.