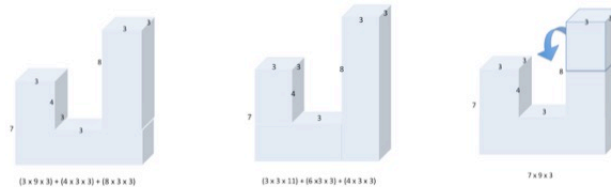## Connecting Representations Instructional Routine Pre-Planner

Consider the Representations:
Explore the mathematical structure that the representations highlight. What are key features of the representations? How do they connect to big ideas of the content?

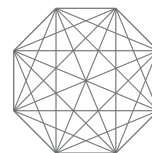| **When considering the representations, ask yourself:**	
What will students notice and think is important about the different representations? How will they use those noticings to connect representations?	
How might they connect representations incorrectly?	

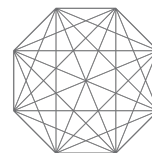| **When considering the students, ask yourself:**	
Which representations will provide access to students? Which representations will be challenging for students?	
Which representation will students be connecting, and which one will you leave off for students to generate?	

Connecting Representations Instructional Routine Planner

Launch

Connecting Representations

WHAT: Match visuals to numeric expressions by **chunking** and **connecting** to math you know

WHY: To "think like mathematicians", to use mathematical *structure* to match two different representations.

Connecting Representations

Think | Make connections | Share & study connections | Create representation | Reflect on learning

What will you say to students about *what* they be doing and *why*?

Interpret and Connect Representations

Think

- What part of the *visual* will help me connect to the *expressions*?

- What about the *expressions* will help me connect to the *visual*?

Will you unveil all 5 representations or decide to unveil one type of representation first? If you unveil one first, which type?

Make Connections

"I noticed… so I knew..."
"I saw….so I looked for…"

Which connections will you share? In what order?

Discuss Representations

Share & Study Connections

We noticed… so we …
We knew... so we…

They noticed… so they ...
They knew... so they...

Will students self-select the speaker and the pointer/gesturer, or will you pre-select the roles?

What questions will you ask to highlight structural underpinnings of the representations?

How will you annotate connections?

Create Representations

Create a Representation

THINK

Ask yourself…
- "What do you notice about this *visual*?"
- "How can you chunk this *visual* into pieces you can describe with an expression?"

What 'ask yourself questions' will you pose?

Create a Representation

Pair

- Share your interpretations of the *visual*.
- Together create a matching *numeric expression*.

Which representation will you plan to share in the full group?

Create a Representation

Share

They noticed… so they…

When they saw…it made them think

How will you annotate the newly created representation to highlight the connection and underlying structure?

Reflect on Thinking

Meta-Reflection

A. When interpreting a *expression / visual*, I learned to pay attention to…

B. When connecting representations, I learned to ask myself…

C. A new mathematical connection I made is …

What reflection prompts will you provide?