Teaching Lab

Compare & Connect Guide

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CRITERIA	PLAN	APPLY	OPTIMIZE	EXTEND
MATHEMATICAL LANGUAGE				
The teacher leads students to progress to the mathematical learning goal through mathematical language.	The teacher plans to identify a grade-level task worthy of optimizing output and cultivating conversation, describe how optimizing output and cultivating conversation contribute directly to the mathematical learning goal, and generate interest in using mathematical language.	The teacher leads students to use mathematical vocabulary required by the mathematical learning goal and make connections between mathematical vocabulary and the task context.	The teacher leads students to use mathematical vocabulary required by the mathematical learning goal and make connections between mathematical vocabulary and the task context; **AND** use sentence frames and prompts to support receptive language processing and expressive language precision.	The teacher leads students to use mathematical vocabulary required by the mathematical learning goal and make connections between mathematical vocabulary and the task context; **AND** use sentence frames and prompts to support receptive language processing and expressive language precision; **AND** increase the use of relevant mathematical vocabulary throughout the lesson.
REPRESENTATIONS				
The teacher leads students to comprehend multiple solution approaches by identifying, comparing, and contrasting different mathematical representations.	The teacher plans a purpose for comparing at least two representations for a grade-level task aligned to the mathematical learning goal, a series of questions that elicit similarities and differences, and methods to generate interest in mathematical concepts as opposed to answer-getting.	The teacher leads students to identify and articulate similarities and differences between mathematical concepts across any two representations: concrete-visual or visual-abstract.	The teacher leads students to identify and articulate similarities and differences between mathematical concepts across any two representations: concrete-visual or visual-abstract; **AND** additional comparisons are made across the entire concrete-visual-abstract progression **OR** mathematical concepts and approaches are connected directly to their own lived experiences.	The teacher leads students to identify and articulate similarities and differences between mathematical concepts across any two representations: concrete-visual or visual-abstract; **AND** additional comparisons are made across the entire concrete-visual-abstract progression **AND** mathematical concepts and approaches are connected directly to their own lived experiences.
COGNITION				
The teacher leads students to cognitive engagement by optimizing output and cultivating conversation.	The teacher plans opportunities to communicate a clear and compelling purpose for conversation and mutually share ideas about multiple solution methods through constructive mathematical conversations (e.g., pairs, groups, and whole class) by describing mathematical thinking orally, visually, and in writing.	The teacher leads students to internalize a clear and compelling purpose for conversation and mutually share ideas about multiple solution methods through constructive mathematical conversations (e.g., pairs, groups, and whole class) by describing clearly their mathematical thinking to others orally, visually, and in writing.	The teacher leads students to internalize a clear and compelling purpose for conversation and mutually share ideas about multiple solution methods through constructive mathematical conversations (e.g., pairs, groups, and whole class) by describing clearly their mathematical thinking to others orally, visually, and in writing; **AND** use a graphic organizer that illustrates multiple connections between different concepts or ideas.	The teacher leads students to internalize a clear and compelling purpose for conversation and mutually share ideas about multiple solution methods through constructive mathematical conversations (e.g., pairs, groups, and whole class) by describing clearly their mathematical thinking to others orally, visually, and in writing; **AND** use a graphic organizer that illustrates multiple connections between different concepts or ideas; **AND** produce an anchor chart summarizing mathematical ideas and representations for future reference.

Compare & Connect Note-catcher

What to Expect

This video will…

- Introduce the Math Language Routine (MLR) Compare & Connect
- Model Compare & Connect
- Offer a guide to the routine
- Connect to resources for future inquiry and practice

This video is most effective when…

- Paused at critical reflection points
- Paired with the guide and note-catcher
- Experienced with a coach or colleague
- Viewed multiple times as you grow

Apply

Use the space below to model the routine as you watch the video.

Choosing an Appropriate Model

Here are measurements for the maximum height of a tennis ball after bouncing several times on a concrete surface.

n **Bounce number**	***h*** **Height (cm)**
0	150
1	80
2	43
3	20
4	11

1. Which is more appropriate for modeling the maximum height, *h*, in centimeters, of the tennis ball after *n* bounces: A linear function or an exponential function? Use data from the table to support your answer.

2. Regulations say that a tennis ball, dropped on concrete, should rebound to a height between 53% and 58% of the height from which it is dropped. Does the tennis ball here meet this requirement? Be prepared to show your reasoning.

3. Write an equation that models the bounce height *h* after *n* bounces for this tennis ball.

4. About how many bounces will it take before the rebound height of the tennis ball is less than 1 centimeter? Be prepared to show your reasoning.

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Check Your Understanding

Summarize Compare & Connect as a series of four steps.

During the routine, what are the teacher and students thinking about?

Teacher	Students

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Compare & Connect

Cultivating Conversation

Create opportunities for student-to-student interaction in multiple ways that scaffold how they make meaning of the mathematical context.

Optimizing Output

Facilitate opportunities for students to describe their mathematical thinking orally, visually, and in writing.

Check Your Understanding

Is the goal of Compare & Connect to solve a mathematical task?

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Plan

Compare & Connect Routine

Identify a RAISE task for the routine.

Plan to apply the routine.

Steps:

1. State Purpose
2. Create Displays
3. Compare Displays
4. Make Connections

Optimize the routine.

Extend the routine.

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