Co-Craft Questions Note-catcher

What to Expect

This video will…

- Introduce the Math Language Routine (MLR) Co-Craft Questions
- Model Co-Craft Questions
- 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

Take notes on the routine. What is the facilitator doing?

Openstax CC BY NC SA

Two Pools

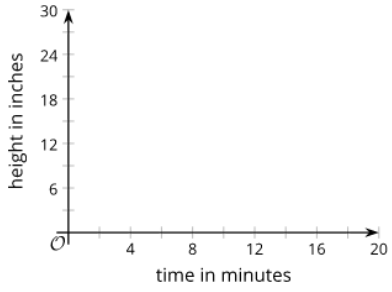
To prepare for a backyard party, a parent uses two identical hoses to fill a small pool that is 15 inches deep and a large pool that is 27 inches wide.

The height of the water in each pool is a function of time since the water is turned on.

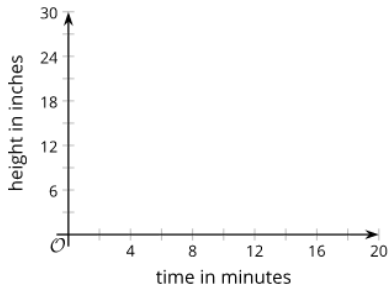
Here are descriptions of three situations. For each situation, sketch the graphs of the two functions on the same coordinate plane, so that is the height of the water in the small pool after minutes, and is the height of the water in the large pool after minutes.

In both functions, the height of the water is measured in inches.

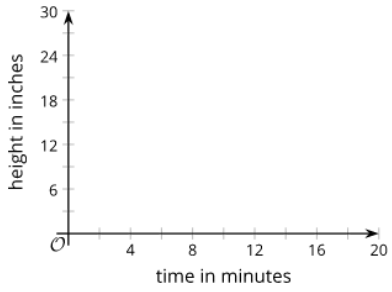
Situation 1: Each hose fills one pool at a constant rate. When the small pool is full, the water for that hose is shut off. The other hose keeps filling the larger pool until it is full.



Situation 2: Each hose fills one pool at a constant rate. When the small pool is full, both hoses are shut off.



Situation 3: Each hose fills one pool at a constant rate. When the small pool is full, both hoses are used to fill the large pool until it is full.



Openstax CC BY NC SA

Teaching Lab

openstax™

Check Your Understanding

Summarize Co-Craft Questions as a series of four steps.

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

Teacher	Students

Openstax CC BY NC SA

Teaching Lab

openstax™

Co-Craft Questions

Cultivating Conversation

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

Conversations make learning more authentic and emphasize mathematical language development.

Maximizing Meta-Awareness

Facilitate opportunities for students to think about their own thinking and language use.

Support students to use and refine their mathematical language during conversation to be better understood and to access the mathematical thinking of their peers.

Check Your Understanding

Is the goal of Co-Craft Questions to solve a mathematical task?

Openstax CC BY NC SA

Teaching Lab

openstax™

Plan

Co-Craft Questions

Identify a RAISE task for the routine.

Plan to apply the routine.

Steps:

1. Hook
2. Students Write Questions
3. Students Compare Questions
4. Actual Question(s) Revealed

Optimize the routine.

Extend the routine.

Openstax CC BY NC SA

Two Pools

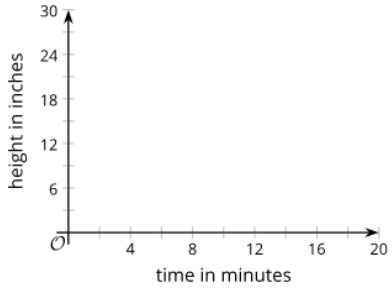
To prepare for a backyard party, a parent uses two identical hoses to fill a small pool that is 15 inches deep and a large pool that is 27 inches wide.

The height of the water in each pool is a function of time since the water is turned on.

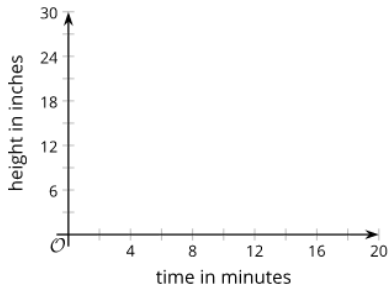
Here are descriptions of three situations. For each situation, sketch the graphs of the two functions on the same coordinate plane, so that is the height of the water in the small pool after minutes, and is the height of the water in the large pool after minutes.

In both functions, the height of the water is measured in inches.

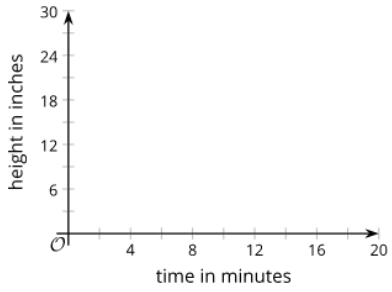
Situation 1: Each hose fills one pool at a constant rate. When the small pool is full, the water for that hose is shut off. The other hose keeps filling the larger pool until it is full.



Situation 2: Each hose fills one pool at a constant rate. When the small pool is full, both hoses are shut off.



Situation 3: Each hose fills one pool at a constant rate. When the small pool is full, both hoses are used to fill the large pool until it is full.



Openstax CC BY NC SA

Teaching Lab

Co-Craft Questions Guide

openstax™

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 cultivating conversation and maximizing meta- awareness, describe how conversation and meta-awareness contribute directly to the mathematical learning goal, and generate interest in using mathematical language.	The teacher leads students touse 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 connec- tions between mathematical vocabulary and the task context; **AND** justify how their questions are mathematical.	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** justify how their questions are mathematical; **AND** increase the use of mathematical vocabulary throughout the lesson.
QUESTIONING				
The teacher leads students to deeply understand a mathematical task through producing and analyzing questions.	The teacher plans a task-aligned "hook," time for students to write questions, time for students to compare questions, the task reveal and anticipated student questions, and methods to generate interest in problem-posing as opposed to answer-getting.	The teacher leads students to propose, review, and compare mathematical questions in response to a "hook" and to understand what the actual task question requires of them.	The teacher leads students to propose, review, and compare mathematical questions in response to a "hook" and to understand what the actual task question requires of them; **AND** reflect on how the actual question compares to the proposed questions.	The teacher leads students to propose, review, and compare mathematical questions in response to a "hook" and to understand what the actual task question requires of them; **AND** reflect on how the actual question compares to the proposed questions; **AND** create an entirely new task(s) using a proposed question(s) tosolve.
COGNITION				
The teacher leads students to cognitive engagement through cultivated conversation and meta-awareness.	The teacher plans opportunities and supports for constructive mathematical conversations (e.g., pairs, groups, and whole class) and time to strengthen the "meta-"connections and distinc- tions between mathematical ideas, reasoning, and language.	The teacher leads students to internalize a clear and compelling purpose for conversation, mutually share ideas about questions, and focus on how to improve communication and/or reasoning about mathematical concepts.	The teacher leads students to internalize a clear and compelling purpose for conversation, mutually share ideas about questions, and focus on how to improve communication and/or reasoning about mathematical concepts; **AND** clarify their own reasoning and that of others.	The teacher leads students to internalize a clear and compelling purpose for conversation, mutually share ideas about questions, and focus on how to improve communication and/or reasoning about mathematical concepts; **AND** clarify their own reasoning and that of others; **AND** reinforce a culture that values introspection and communication effort.

Openstax CC BY NC SA