Session 2: Teaching through Mathematical Processes

90 min

Math Learning Goals

- Make connections among the Mathematical Processes.
- Reflect on how the processes appear in a mathematics class using the TIPS Mathematical Processes package.
- Apply the Mathematical Processes to solving problems.

Rationale

Materials

- BLM 2.1–2.3
- Math Process S2 ppt
- Mathematical Processes package for each participant
- Mathematical Processes posters
- chart paper/markers
- manipulatives
- calculators, graphing technology

Minds On…

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Whole Group → People Bingo

Participants complete their bingo card by finding others in the group who satisfy the criteria described in the cells on the card (BLM 2.1).

Whole Group → Introduction

Introduce the Mathematical Processes package highlighting instructional strategies given for each process: what students do, what teachers do, sample feedback, sample questions, etc.

Display the six Mathematical Processes posters around the room.

Action!

DI

A for L

Individual → Study

Each participant reads the Mathematical Processes package, with particular attention to one of the processes (10 minutes). The process studied should be different from that of their expert group from Session 1.

Small Groups (2 or 3) → Problem Solving

Groups work on a problem of their choice with a variety of tools made available, keeping the Mathematical Process in mind (BLM 2.2, 2.3).

They revisit the problem to solve it in two more different ways. While doing so, they:

- ask questions using the Mathematical Processes package prompts.
- note when they recognize a Mathematical Process being used.

Differentiate content based on participant readiness in order to work in zone of proximal development.

Curriculum Expectations/Observation/Mental Note: Observe participants' ability to solve problems. Provide hints for those who have difficulty finding more than one strategy. Consider which solutions are to be shared in whole group and in what order.

See TIPS Manipulatives Management for a list of possible manipulatives.

Additional or alternate problems from TIPS lessons, Continuum and Connections packages, and other resources can be provided to suit the grade levels taught by the participants.

Consolidate Debrief

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Whole Group → Share

Each group places a solution on chart paper indicating the Mathematical Process(es) used and posts it. Pre-determined solutions are shared with the whole group.

Discuss: How did solving this problem in more than one way encourage and promote the use of different Mathematical Processes?

Exploration Reflection

Home Activity or Further Classroom Consolidation

In your Reflection Journal write about the interconnectivity of the Mathematical Processes and problem solving.

Investigate other ways to solve the problem you were given.

2.1: People Bingo: Find someone who…

Write the person's first and last name.
Fill in the blank if there is one. (Every name must be different.)

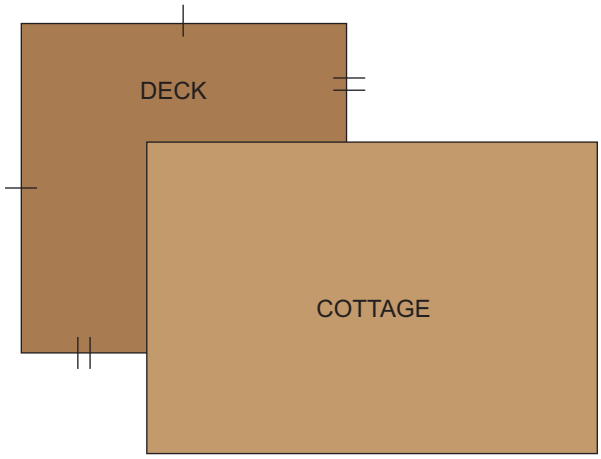
1st Bingo: the diagonals
2nd Bingo: full card

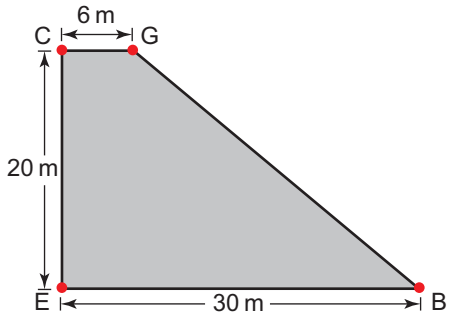
Find someone who…

…has been white water rafting. Where: _____	…knows how to scuba dive or snow board.	…is in their last 5 years of teaching.
…speaks 2 languages in their home. Languages _____, _____	…can name at least 5 of the Mathematical Processes. Name them: _____ _____ _____ _____ _____	…plays a musical instrument. Name it: _____
…was not born in Canada. Where: _____	…is in their first 5 years of teaching.	…visited somewhere outside Canada this past year. Where: _____

2.2: DECK PROBLEM

You have been hired to build a deck attached to the second floor of a cottage using exactly 48 prefabricated 1 m × 1 m sections. Determine the dimensions of at least two different decks that can be built in the configuration shown. Will different decks require the same amount of railing? Explain.



2.3: Trapezoid Problem

Three employees are hired to tar a rectangular parking lot with dimensions 20 m by 30 m. The first employee tars one piece and leaves the remaining shape, shown below, for the other two employees to tar equal shares. Show how they can share the job. Justify your answer.