



Encourage 'Thinkering' in Problem Solving

NATS/NATM 2019

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Grade 3-Watching Wheels-3.01

3.01

If there are 50 wheels on vehicles parked in our school, how many vehicles could there be?



Think

- If all the wheels are on motorcycles, how many motorcycles are there?
- Could all 50 wheels be on cars only? How do you know?
- How will you record the different combinations of vehicles for 50 wheels?

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Grade 4-Making a Million-4.01

4.01

Suppose we could place one million dollar bills end to end. What would the total distance be?



Think

- Will you need one million dollar bills in order to answer this question?
- If we placed the first dollar bill at the entrance of our school, how far do you think one million dollars would reach?
- In order to determine the length of a million dollar bills, what do you need to find out?
- How might you organize your work?

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Grade 5-State Populations-5.01

5.01

What do you think our state's population will be in 10 years?



Think

- How many people live in our state now?
- Is knowing the current population of our state enough information for you to predict the population in 10 years?
- What other information do you need to predict the population in 10 years?
- How will you arrange the data to help you make your prediction?

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Warm Up

A new tunnel will be exactly one kilometer long. The machine bores $\frac{1}{3}$ meter every 6 hours. If they work 24 hours a day, how many days will it take to bore the tunnel?

ORIGO Stepping Stones

Encouraging Reflection and Justification

Aha!

"I think this will work!"
"I understand what to do next!"
"I got it!"

A Question or a Problem

"What do I know?"
"What am I trying to figure out?"

Making the Mathematics Visible

"Can I do this mentally?"
"Do I need to draw it out or use a model?"
"Do I need some other tool to show my thinking?"

Gathering Information

"Hmmm... I notice..."
"I wonder if..."

Problem Thinking

*"Now that I've seen a pattern,
let me keep trying..."*

Tinkering

"Let me try..."
"I think I know where I can start..."

Adapted from: C. Charney and J. Maxfield

How do we create a good problem-solving environment?

- Be a model problem solver
- Allow for risk taking and mistake making
- Ask good questions
- Require students to justify their thinking
- Understand that it is not a straight path to the solution