

# High Yield Routines and Resources and RtI to Support Math Instruction

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***Teaching and Learning.* An excellent mathematics program requires effective teaching that engages students in meaningful learning through individual and collaborative experiences that promote their ability to make sense of mathematical ideas and reason mathematically.**

The first Guiding Principle of NCTM's  
Principles to Actions

# **AGENDA**

- **Introductions**
- **PtA Math Teaching Practices**
- **Routines**
- **Resources**
- **Wrap-up**

# Introductions

# **INTRODUCTIONS**

- **Gina Kilday**

- **Math Interventionist Grades 2-6, Exeter, RI**
- **NCTM Board of Directors**
- **RIMTA Past President, RIMTA & ATMNE Boards**

- **You**

- **Grade Level: K-2, 3-5, 6+**
- **Role: Classroom Teacher, Coach/Interventionist, Administrator**
- **NCTM Member**

# Principles to Actions



# **PtA MATH TEACHING PRACTICES**

- Establish **mathematics** goals to focus learning.
- Implement **tasks** that promote **reasoning** and **problem solving**.
- Use and connect **mathematical** representations.
- Facilitate **meaningful** mathematical discourse.
- Pose **purposeful** questions.
- Build **procedural** fluency from **conceptual** understanding.
- Support **productive struggle** in learning mathematics.
- Elicit and use evidence of **student thinking**.

# Routines



# **ROUTINES**

- **Number Talks/Number Strings**
- **3-Act Tasks**
- **Notice and Wonder**
- **WODB/Eliminate It**
- **Data Day**
- **Puzzles: Kakooma and KenKen**

# **Number Talks/Number Strings**

- **Short daily routines that help students develop computational fluency**
- **Not intended to replace curriculum or take up majority of time**
- **Takes 5 to 15 minutes and most effective 3-5 days per week**

# Sample Number String

When you have a strategy for solving, put up your pointer finger. For each additional strategy you think of, put up another finger. We will focus on the strategy and talking about the numbers, not the answer.

- $24 + 10$  (entry problem)
- $24 + 9$  (helper problem)
- $36 + 19$  (more advanced helper problem)
- $48 + 29$  (challenge problem)

# 3-Act Tasks

Engage students at various entry points and create a deep need for the math!

Act 1: Introduces the central conflict and hooks the participant

What do you notice? What do you wonder? What do you think/estimate?

Act 2: The participant overcomes obstacles, looks for resources and develops tools

What do you need to know in order to answer your question? [\(image\)](#)

Act 3: Resolve the conflict

*Thanks to **Dan Meyer** and **Graham Fletcher** for their inspiration!!!*

# NOTICE/WONDER

Noticing and wondering is a tool to help students:

- Understand the story, the quantities, and the relationships in the problem.
- Understand what the problem is asking and what the answer will look like.
- Have some ideas to begin to solve the problem.

# NOTICE/WONDER example



Photo: HONS/AP via npr.org

The farmer shaved off 89 pounds of wool, leaving a sheep that weighed 94 pounds. How much did the fluffy sheep weigh with all of its wool?

The farmer shaved 534 pounds of fleece. If he shaved 6 sheep and they all had about the same amount of fleece, about how much wool was sheared from each sheep?

When a sheep that is this fluffy gets sheared, the farmer will shear off about 89 pounds of fleece. If the farmer shears sheep that are all fluffy like this one and she gets about 1068 pounds of fleece, how many sheep did she likely shear?

Photo and scenario from [www.bedtimemath.org](http://www.bedtimemath.org)

# NOTICE/WONDER activities

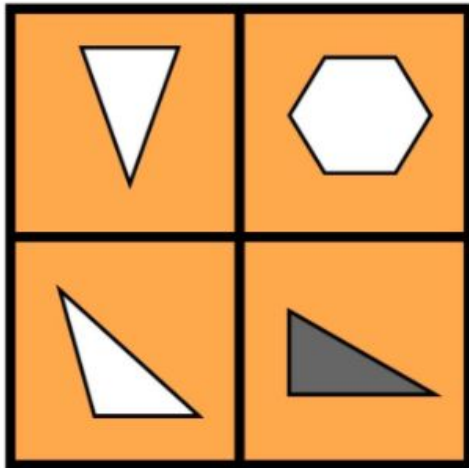
Some activities with noticing and wondering:

- **Basic Brainstorm** - Promote deeper understanding of problems
- **Forget the Question** - Allow access for all
- **Think Pair Share** - Increase engagement and accountability

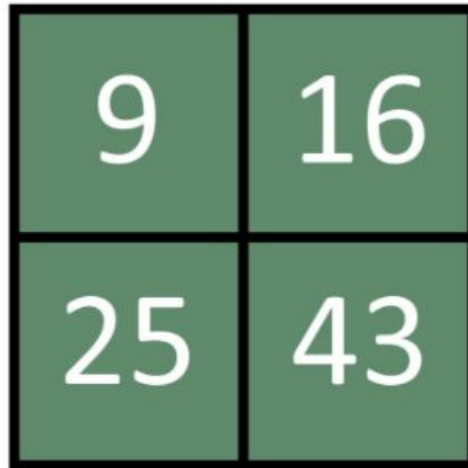
# WODB/Eliminate It

- Four math concepts
- Identify which one doesn't belong and justify why.
- Typically have more than one correct answer - emphasize justification and reasoning

<http://wodb.ca/> or <https://hcpss.instructure.com/courses/107/pages/eliminate-it>



SHAPES

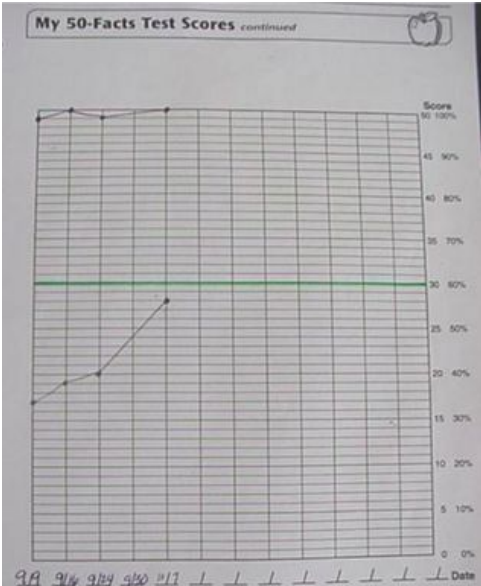
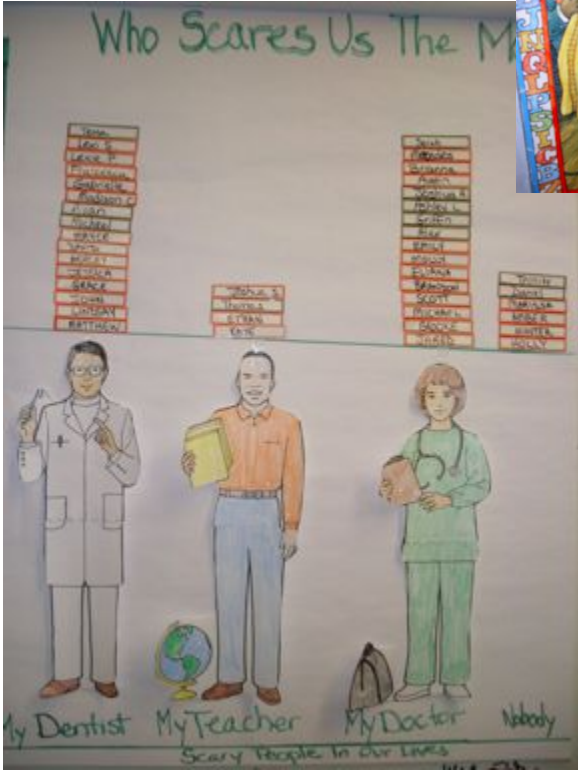
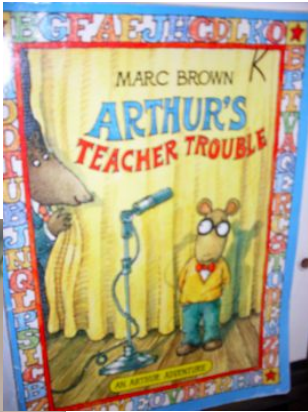


NUMBERS

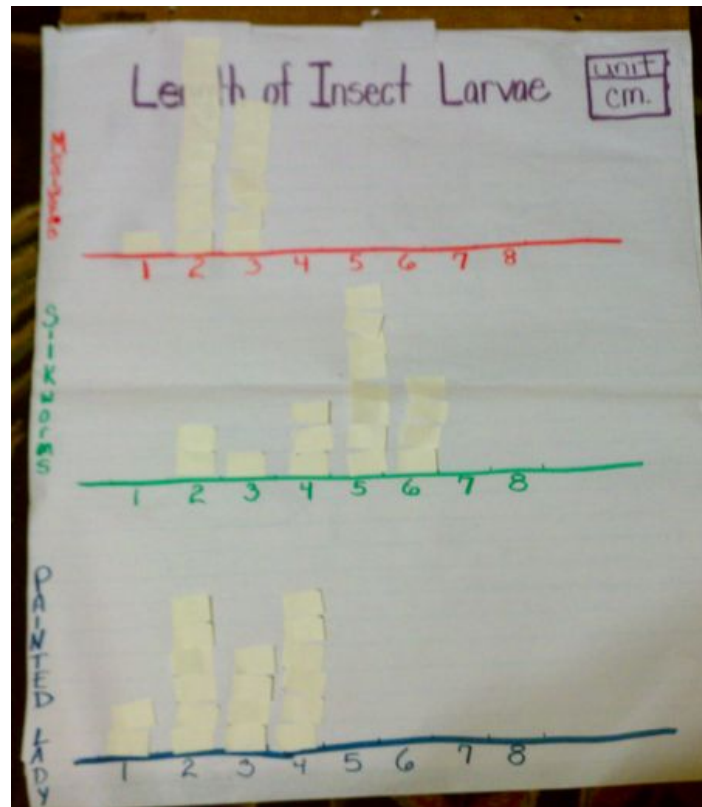
*examples from [www.wodb.ca](http://www.wodb.ca)*



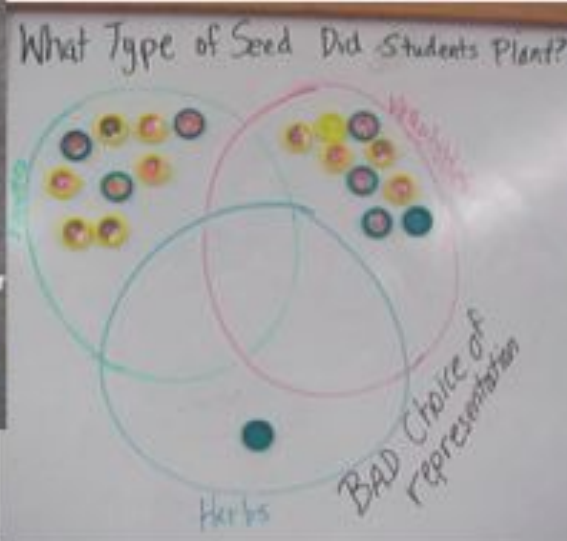
# DATA DAY



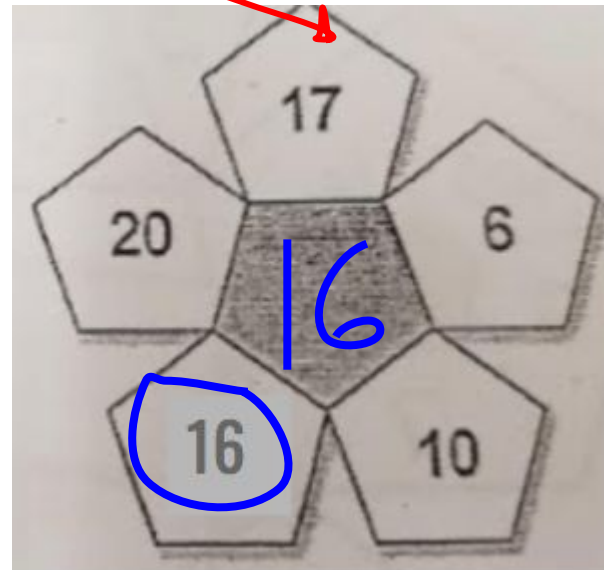
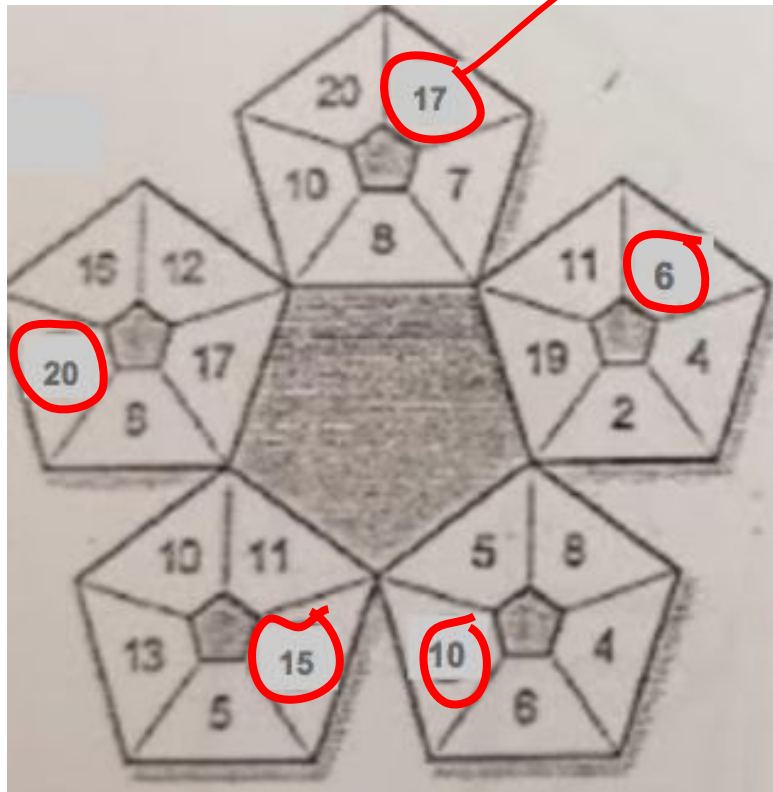
# Data Day, cont.



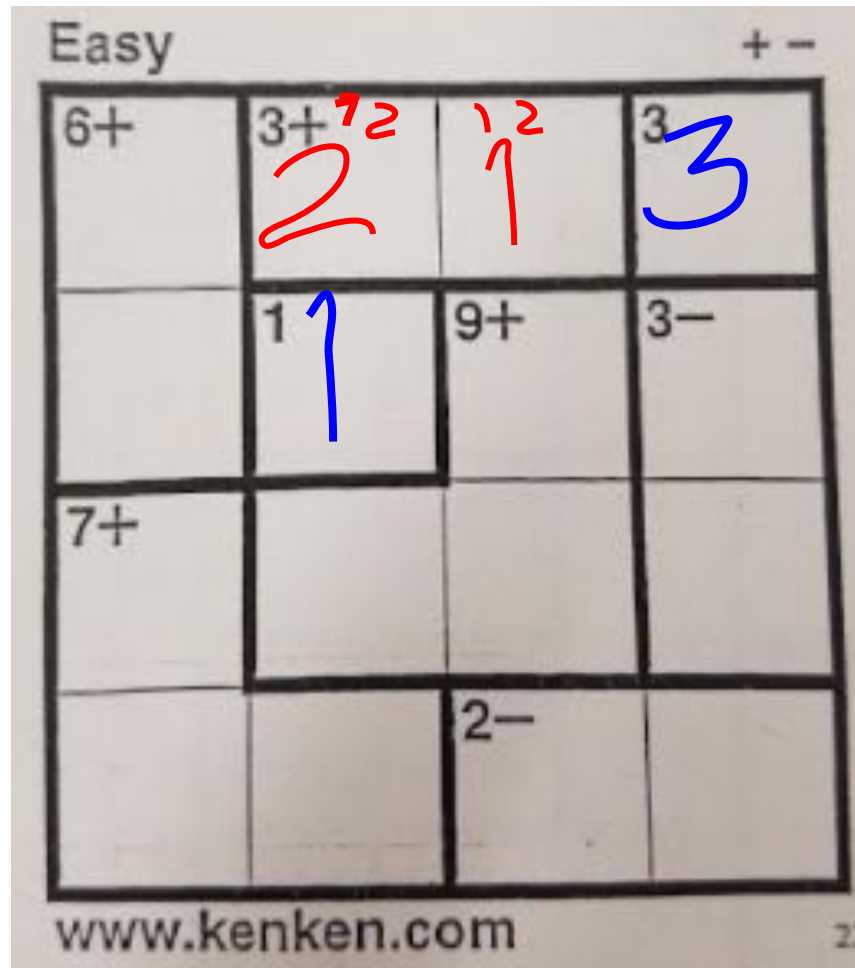
# Data Day, cont.



# PUZZLES- Kakooma



# PUZZLES - KenKen



# Resources

# RESOURCES

- **#mtbos – Math Twitter Blogosphere**
- **Professional organizations**
- **NCTM.org**



# **#mtbos - The Math Twitter Blogosphere**

- **A community of math teachers on the internet**
- **No membership required**
- **Twitter exchanges, resources, websites, articles**
- **It is what you make of it: PD, mentoring, idea exchange**
- **Opportunities for reflection**
- **Other Twitter Chats: #tcmchat #edchatri #mathtalkchat  
#mtmschat #ElemMathChat**



# **PROFESSIONAL ORGANIZATIONS**

- **Resources, networking, professionalism, support**
- **Local Regional Affiliate: i.e., RIMTA, etc.**
- **Affiliates at Large: i.e., TODOS, WME**
- **NCTM – National Council of Teachers of Mathematics**
  - **World's largest mathematics education professional organization**
  - **60,000 members and more than 230 Affiliates in the USA and Canada**
  - **Support \* Thrive \* Give Back \* Belong**

# Getting the Most Out of Your NCTM Membership

## **PUBLICATIONS and RESOURCES**

- **Journals** - monthly featured articles, with twitter chats
- **Classroom Resources** -
  - PoWs, Illuminations, Calculation Nation
  - ARCs, Student Explorations in Mathematics

## **PROFESSIONAL DEVELOPMENT**

- **Conferences, Webinars and Twitter Chats**

## **COMMUNITY**

- **MyNCTM.org** - Online Community
- **MET Grants**
- **AND SO MUCH MORE!!!!**

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| <b>Illuminations</b>  | ✓  | ✓  |
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- or -
- Renews

# PtA MATH TEACHING PRACTICES



*Which routines supported which practices? How?*

- Establish **mathematics goals** to focus learning.
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- Elicit and use evidence of **student thinking**.

# Questions? Thanks!

[gkilday@gmail.com](mailto:gkilday@gmail.com) NCTM discount: **BOARD18**