# Number Talks 

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## Why are we talking about this today?

The QSR Walkthrough, climate and culture survey, administrator observations (via formal classroom observations), attendance data, anecdotal references, and direct conversations have revealed $\underline{a}$ serious need to improve the climate and culture in Dunn Middle School.

In addition, many students have shared with me that they often do not feel valued or "listened to" in class, which leads to inattentive and/or disruptive behavior.

## Why are we talking about this today?

Many teachers have shared that they are working to build and/or improve their relationships with students.

Building these relationships will help to build camaraderie, improve student buy-in, decrease disruptive and off-task behavior, increase academic risk-taking, and therefore increase academic investment and selfesteem.

## Why are we talking about this today?

Throughout the entire school year, we have been working on increasing student talk, driving depth, increasing student confidence and competence.

We have had varying degrees of success with this, but still need to improve with all of these (as indicated on the previous slide)

A Number Talk is another strategy that we can incorporate into our daily lessons to improve in all of these areas
$4^{\text {th }}$ marking period is a great time to PRACTICE new methods and concepts.

# Definition: " What is a Number Talk? 

A Number Talk is a short, ongoing daily routine that provides students with meaningful ongoing practice with computation.

A Number Talk is a powerful tool for helping students develop computational fluency because the expectation is that they will use number relationships and the structures of numbers to add, subtract, multiply and divide.

## Definition: " What is a Number Talk?

- Number Talks should be structured as short sessions alongside (but not necessarily directly related to) the ongoing math curriculum.
- It is important to keep Number Talks short, as they are not intended to replace current curriculum or take up the majority of the time spent on mathematics.
- In fact, teachers need to spend only 5 to 15 minutes on Number Talks. Number Talks are most effective when done every day.


## Introduction to number talk (for the students)

## Sherry Parrish: Number Talks: Building Numerical Reasoning

We need to help students develop number sense...
and the interesting thing about number sense is that you cannot teach a student to have it...

You have to provide opportunities for it to be developed.

## Multiplication: $16 \times 35$

## Do Now:

(please do this individually)

## Evaluate the following for $x=3$ :

$$
4(5+2 x)
$$

## Do Now:

(please do this individually)
This time, answer the same question as though you were a student who answered It incorrectly.

Evaluate the following for $x=3$ :

$$
4(5+2 x)
$$

How do you encourage students to use the 8 Standards for Math. Practice?

## Standards for Mathematical Practice

1.Make sense of problems and persevere in solving them.
2.Reason abstractly and quantitatively.
3.Construct viable arguments and critique the reasoning of others.
4.Model with mathematics.
5.Use appropriate tools strategically.
6.Attend to precision.
7.Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

## Number Talks: introduction

## (Best Practices Weekly)

## Ex: $16 \times 25$

Key components:

- Developing number sense
- review mathematical practices
- link to strategies for computation: place value and properties.

Develop understanding:

- strategies (individually developed),
- algorithms (take strategy, test it to ensure that it always works, then formalize it),
- standard algorithm - compare with student algorithms.


## Class environment/community

- Errors are okay...they allow for a rich discussion!
- Be supportive -- allow for a variety of answers
- Avoid judgments (correct/incorrect, "that's good" or "that doesn't work" ) during the answer phase. Keep a good poker face.
- Encourage the students to question responses and/or reasoning during discussion phase. - Model respectful behavior for students.


## Class discussion -

Give students a minute or two to try to work it out on their own/different ways to solve it.

- Use "quiet" hand signals for "l'm ready", "| agree", "I have another way", etc. Ask students to find a second or third way to get the same answer
- Take all different answers that are out there, then lead discussion about them - merits, explanations, etc.


## Class discussion -

- Provide open-ended questions to stimulate critical thinking (why does it work, is there a different way, easier/harder than a different method, etc.)
- "Turn and talk" - have students turn and talk: Did you get the same answer or a different answer? How did you get your answers? Did you use the same method or a different method?
- Don't get excited about a "wrong answer" - try to determine the thinking that went into it and work (with the class) to restructure the thinking. Try to push the misconceptions to the forefront so that they can be addressed. Push for accuracy, flexibility, efficiency


## Teacher's role:

## Facilitator - Lead discussion: not direct

 instruction....not giving answers or explanationsFocus on compare/contrast/evaluate. Note where these are on Webb's DOK scale.

Avoid "math as a series of procedures"

## Teacher's role:

## Facilitate discussion:

## ask honest questions,

 listen to student thinking, learn with students, record to make the mathematics explicit.
## Take the student responses and represent them visually and/or mathematically.

## Quick Notes about Number Talks

Keep them short.
Encourage sharing and clarify students' thinking.
Teach intentionally
Start where your students are
Choose related sequences of problems
Chart the students' thinking so that it can be saved and referred to later.

## Quick Notes about Number Talks

Create a safe and supportive environment. Accept answers without praise or criticism Allow students to ask questions of each other Encourage students to listen to each other. Encourage students to self-correct.

## Quick Notes about Number Talks

Vary the Number Talks to meet the range of needs.

Vary the sharing strategies used Pair share
Share whole group
Explain someone else's strategy
Vary the level of difficulty with a Number Talk Use written problems
Use word problems

## Quick Notes about Number Talks

Record the students' thinking using correct notation on the board, on the overhead, or on chart paper.

## Quick Notes about Number Talks

Give students lots of practice with the same kinds of problems.

When planning or implementing a Number Talk, consider the following:

How do students get their answers?
Can students use what they know for related problems?
How well can students verbalize their thinking?
Are errors way off or are they reasonable?

## Quick Notes about Number Talks

The role of the teacher during a Number Talk is to facilitate and guide the conversation The teacher purposefully chooses children to share strategies that will move the class toward computational fluency
The teacher asks questions that draw attention to the relationships among strategies
It is important to focus on the mathematics, not just the variety of strategies. Mathematically, why does the strategy work?

## Stuff I often say during math talks

 [http://www.mathtalks.net/teachers.html]Thank you for sharing.
Please let me know if I'm not rephrasing you correctly. (I'm only rephrasing when I have trouble hearing the student.)

I want to make sure we're writing down your thinking correctly, please slow down and tell us more about this step.

## Stuff I often say during math talks

[http://www.mathtalks.net/teachers.html]
I'm not worried about the correct answer right now, I'm just interested in how you thought about the problem.

Your sharing of how you arrived at the incorrect answer is really important - I think we learn a lot from our mistakes, and as you can see, you weren't the only one who thought about it that way.

## Stuff I often say during math talks

 [http://www.mathtalks.net/teachers.html]Did you change your mind or question your strategy after you talk with your neighbor?

Who did the problem differently than the 3 people whom I called on to share?

## I really appreciate how you questioned [and responded to] ___ 's sharing.

I know it's kind of tough to articulate your thinking. That's okay. Take your time.

## Activity

Work with a partner who teaches the same grade level. Select topic or skill from your Unit 5 SLOs. Then:

Create a "math talk" on the topic (see pages 7 and 8 of your handout).

1. What vocabulary and/or concepts would you want to insist are "covered" during this math talk?
2. Select problem(s): What will you display initially?
3. Strategies (to solicit from students)/different ways to think about the problem/solve the problem. What strategies might you expect to hear? What strategies might you show?

## Thank you!

Please make sure that you have signed in for today's session.

Please complete an exit ticket before you leave.

