

Daily Math Review

Key Components:

1. Student Collaboration
2. Key Statement Ideas
3. Error Analysis
4. Student Reflection

Overview

- Occurs first 15 minutes of class daily
- 2-3 problems are written on the board and students copy them in journals (or teacher can prepare sheets ahead of time) and solve
- Each problem represents a different strand
- Reinforce prior learning and provide daily practice to strengthen core curriculum
- Teacher directed feedback moves to student directed
- Students work with a partner to **collaboratively** solve given problems
- Students discuss reasonableness of answer and estimation
- Students' mathematical reasoning and number sense is fostered

Preparation

- Key Idea Statements
- Notebook or prepared sheets/packet
- Marking pens or colored pencils
- Pencils
- Manipulatives when appropriate
- Teacher designated partners (recommend changing partners every 3-4 weeks)
- Biweekly quiz

Daily Math Review

Teacher Directed

Teacher directs the students to do the following:

1. Write name and date in the upper right hand corner
2. Write math review on the top line
3. Students will number and copy the problems
4. Students will give thumbs up when completed (or other signal of active engagement)

Independent Work Time

Time: 2-3 minutes	Purpose: Students begin to solve problems.
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Students Actions –

- Students work on the math review problems for 2-3 min. independently, getting as much finished as they can, but completion is not expected in this time frame.

Teacher Actions –

- Walking around
 - Monitoring student work
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Collaboration (Partner Work)

Time: 6 minutes	Purpose: Students collaboratively solve problems.
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Students Actions –

- Students work with their designated partner for 6 min. to complete the math review problems.

Teacher Actions –

- Walking around
 - Listening to student explanations for the purpose of:
 - Identifying student misconceptions
 - Choosing students who may need additional help (small group)
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Processing (Teacher Leads)

Time: 5-6 minutes	Purpose: Students affirm correct answers. Students find errors. Students reflect on learning.
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Following Directions

- Instruct students to put away pencils and hold up their marking pen.
- If you put your name on your paper, put a star by it.
- If you put the date and title on your paper put a star by it.
- Check your partner to see if they put stars on their paper.
- Check to see if you numbered all your problems, wrote all of the problems and showed all your work.
 - If you did writes "I am awesome at following directions" in the margin.
 - If you did not, write "I need to work on following directions" in the margin.

Note: Part of this training is to get students to follow directions and shows their work so that we learn what they did both correctly and incorrectly.

Processing of Error Analysis and Reflection

- Next to number one. If you wrote, Expanded Notation, put a star next to it (**reinforces vocabulary**)
- If you wrote, 400, give yourself a star. If you didn't write 400, circle your answer and fix it.
- If you wrote, 20, give yourself a star. If you didn't write 20, circle your answer and fix it.
- If you wrote, 6, give yourself a star. If you didn't write 6, circle your answer and fix it.
- Write reflection on how you did on the problem. It needs to be a complete specific sentence. (I had trouble with... or I understand...)
- Students stand up after writing reflection and then share with partner. This shows student understanding of the concept. Listen to students and ask one with a specific reflection to share with class.

Key Statement

- Student states/records key concept statement in under the problem
- Students restates concept statement together (ex. The value of a digit is determined by its position). Repeat concept statement (partner and as a class)

Repeat procedures for all of the math review problems

Daily Math Review

Student Directed

Teacher directs the students to do the following:

1. Write name and date in the upper right hand corner
2. Write math review on the top line
3. Students will number and copy the problems
4. Students will give thumbs up when completed (or other signal of active engagement)

Collaboration (Partner Work)

Time: 8 minutes	Purpose: Students collaboratively solve problems.
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Students Actions –

- Students work with their designated partner for 8 min. to complete the math review problems.

Teacher Actions –

- Walking around
- Listening to student explanations for the purpose of:
 - Identifying student misconceptions
 - Choosing students who may need additional help in small group
 - **Identifying students that could lead Processing of problem**

Processing (Student Leads)

Time: 6-8 minutes	Purpose: Students affirm correct answers. Students find errors. Students reflect on learning.
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Teacher selects student pairs to walk through the error analysis, reflection, and key statement portion. This becomes an “agree/disagree” process when students are providing the error analysis.

Daily Math Review Quiz

The Math Review Assessment

Timing

- About every 10 days (ex. Every other Friday)
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Number of Problems

- 2-4 problems for each category that has been on the Daily Reviews
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Correcting the Assessment

- Correct the quiz with the students to provide immediate and specific feedback.
 - Have students star for correct answers and check for incorrect answers.
 - Collect and review assessments
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Student Reflection and Plan

- **Reflection**
 - Students write a reflection on the back of their assessment based on how they did.
 - They should focus on what they did well, as well as, what areas they need to improve on.
- **Improvement Plan**
 - Students write underneath the reflection their plan for improvement on the areas they need to work on.

* This will need to be modeled.

Teacher Analysis of the Assessment

Category Determination

- If at least 90% of the students scored 100% on a category then the category will not be in Daily Math Review during the next cycle.

Example:

Mrs. Jones has 24 kids in her class.

22 (91%) of the students scored 100% on the Daily Math Assessment in the adding fractions category. Adding fractions will no longer be one of the three categories on the DMR.

20 (83%) of the students scored 100% on the Daily Math Assessment in the subtracting fractions category. Subtracting fractions will continue to be a category on the DMR the next two weeks until it is tested again.

Daily Math Review

Sample Key Statements

When creating key statements remember:

- Use student-friendly language (not all examples below are student-friendly).
- The statements are the conceptual reasoning behind the skill.

The following key statements were developed by the authors of Five Easy Steps to a Balanced Math Program: Larry Ainsworth and Jan Christinson.

Category	Key Idea
Expanded Notation	<ul style="list-style-type: none">• The value of a digit is determined by its position.
Scientific Notation	<ul style="list-style-type: none">• Powers of 10 move the decimal point.• Scientific Notation is used for very large or very small numbers.
Regrouping	<ul style="list-style-type: none">• A quantity can be rearranged in different ways and it is still the same quantity.
Multi – Digit Multiplication	<ul style="list-style-type: none">• Partial products can help determine an answer to a multiplication problem.• The value of a digit is determined by its position.
Multiplying Decimals	<ul style="list-style-type: none">• Multiplying the whole numbers helps place the decimal.• A reasonable answer helps place the decimal.
Division	<ul style="list-style-type: none">• Division indicates the number of equal pieces in a given quantity.
Division with Remainder	<ul style="list-style-type: none">• A remainder is part of the divisor expressed as a fraction or a decimal.
Adding Unlike Fractions	<ul style="list-style-type: none">• A common denominator shows same size pieces.
Equivalent Fractions	<ul style="list-style-type: none">• A fraction can be represented in various equivalent ways.
Telling Time	<ul style="list-style-type: none">• A clock uses a base of 60.• Each number on a clock represents a group of 5.
Money	<ul style="list-style-type: none">• Counting money involves skip counting by 1's, 5's, 10's, and 25's interchangeably.
Geometry	<ul style="list-style-type: none">• Shapes are classified by their attributes.• Area is the measure of covering expressed in square units.• Perimeter is the distance around a shape expressed in linear units.
Area	<ul style="list-style-type: none">• The area formula comes from the perpendicular relationship of base and height.
Algebra	<ul style="list-style-type: none">• An equation shows two equivalent quantities.
Integers	<ul style="list-style-type: none">• Adding the opposite helps with subtracting integers.
Data	<ul style="list-style-type: none">• Mean, median and mode tell about the center of data.

Secondary Big Ideas/Concept Statements

- Every proportional situation gives rise to a linear relationship with a graph that goes through the origin. The constant ratio in the proportion is the slope of the graph.
- A function is a situation in which a change in one thing (independent variable) causes a corresponding change in a another thing (dependent variable).
- Variables are symbols that take the place of numbers or ranges of numbers. They are used to represent quantities that vary or change.
- Functions are relationships or rules that uniquely associate members of one set with members of another set.
- Functional relationships can be represented in real world contexts, graphs, symbolic equations, tables, and words. Each representation provides a different view of the same relationship.
- A graph is a picture of the rate of change of one variable in terms of the other.
- The rate at which the function values increase or decrease can be determined by the steepness of the line. The steepness of the line is the slope of the line.
- Graphs of equivalent ratios are straight lines passing through the origin.
- A proportion is a relationship of equality between two ratios.
- Solving Proportions: A proportion is true if the cross products are equal.
- Ratios can be meaningfully reinterpreted as quotients.
- Functions are single-valued mappings from one set- the domain of the function- to another- its range.
- A rate of change describes how one variable quantity changes with respect to another.
- Linear functions are characterized by a constant rate of change.
- Graphing Functions: Knowing the graphs of our parent functions and using the rules of transformations can aid us in sketching the graph of a function.
- Tangent Lines: In order to write the equation of a line, we need to know its rate of change (slope) and a point on the line.
- Solving Right Triangles: Using properties of triangles and trigonometry will help us to solve right triangles.
- Limits: Limits are the intended height of a function.
- Points of Intersection: To find points of intersection, we need to solve the system of equations.
- Add/Subtract Rational Expressions: To add/subtract rational expressions, create equivalent fractions with the same denominator then add or subtract as indicated.

Mental Math Component

- 3-problem computational workout for the brain
- Approximately 5 minutes
- Follows Math Review but can be done at other times of the day, such as lining up for recess, transition times, walking from classroom to other areas of the school, etc.

Purpose

- Provide students with mental practice in computing basic number facts and combining math operations.

Themes for mental math include:

- Number operations
- Number properties
- Fractional operations and concepts
- Math vocabulary
- Exponents
- Square roots
- Percents-decimals-fractions

Steps

- Provide students with mental practice in computing basic number facts and combining math operations pause briefly after each operational step
- students do not write anything down until the final answer
- the teacher repeats the same problem to allow student who might need a second chance to succeed
- the teacher then asks the students to say the answer aloud together
- once students are familiar with the procedure, 3 mental math problems can be done in 5 minutes
- to engage students in learning math vocabulary, incorporate a term in a math mental problem (example: "Start with a dozen; subtract half a dozen;...")

example: Start with the square root of 144 (12); add the square root of 81 (21); divide by 7 (3); cube the result (27); add 3 (30); multiply by 4; equals ...