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Why Balanced Mathematics?

The Balanced Math Program provides a successful, high impact, mathematics format, for students learning mathematics within a rich learning environment.

The program involves students at all ability levels and encourages them to enjoy mathematics while developing strong problem solving and communication skills. This program produces students who are confident in their ability to take risks and approach problems. Students become active participants in exploring, discovering and explaining mathematics.

While this handbook focuses on Balanced Mathematics in Grades 2 to 6, the same approach has been used successfully beyond Grade 6. The principles described can be adapted with ease to fit a wide range of mathematics content and students in different grades with diverse skills.

Traditionally, teaching mathematics often meant having students obtain answers and then rely on the teacher to determine whether the answers were correct or not. For example, students were expected to learn the rules and patterns of problem solving and memorize algorithms that were given to them by the teacher.

The Balanced Mathematics Program focuses on understanding the processes and strategies that lead to effective problem solving. The term “Balanced” describes the equality of learning opportunities for students using the five components of:

- Independent Math Journals
- Shared Problem Solving
- Modelled/Guided Problem Solving
- Math Games
- Math Facts.

Students participate in all five components of the Balanced Mathematics Program on a rotating five day schedule. With the exception of Independent Math Journals, students work in small groups where they feel comfortable and more willing to speak out and explore ideas. In small groups students develop social skills as well as communication skills. They pose and challenge ideas as well as seek advice from their peers. Students learn to defend and justify their own ideas.

Independent Math Journals

In this component of the Balanced Math Program, students work independently to explain, respond to other students and justify their own thinking about mathematical concepts and ideas. Using math word walls and personal math dictionaries, students build their mathematical vocabulary, make personal connections to their thinking and develop their reflective thinking skills. This leads to a more comprehensive understanding of mathematical concepts.

The Independent Math Journals chapter of this handbook explains:

- the process of writing math journals
- the use of math word walls and personal math dictionaries
- how teachers can model math journal writing
- the assessment of math journals.

This chapter also provides a rubric and student journal samples with a description of how each sample was assessed according to the rubric. A list of generic math journal topics along with a list of specific concept-related topics is included. There are many story books that relate to math concepts and a list of some suggested story books with math themes is also provided.

Shared Problem Solving

The Shared Problem Solving component of the Balanced Math Program brings together a small group of students working together to solve a mathematical problem. Shared Problem Solving gives students the opportunity to explore and build skills for successful problem solving. This component promotes team work and communication while building individual confidence. Participation in Shared Problem Solving on a regular basis as one of the five components of the Balanced Math Program, encourages students to actively contribute ideas, listen to and respect the ideas of others. The Shared Problem Solving chapter explains:

- the individual responsibilities for each student in the group
- examples of how to model Shared Problem Solving
- a sample of a student developed problem solving rubric
- prompts for Shared Problem Solving
- the “level 3” checklist.

Communication is one of the four categories that are critical in the success of mathematics. At the end of a five day rotation of the Balanced Math Program, when all students have participated in the Shared Problem Solving group, the students have the opportunity to share their groups’ solution in an oral presentation called “Share the Wealth”. The weekly Share the Wealth sessions invite the students to compare and discuss their solutions with the rest of the class. This encourages students to take ownership of their solutions and also enables them to see different approaches to the same problem. Share the Wealth sessions are discussed further in the Shared Problem Solving

chapter. Also included in the Shared Problem Solving chapter are templates for:

- Shared Problem Solving jobs
- Shared Problem Solving jobs tracking
- Shared Problem Solving prompts
- Share the Wealth prompts
- Steps for Problem Solving.

At the end of the chapter there is a bank of mathematical word problems, suitable to use for the Shared Problem Solving group.

These problems are written for a grade 3-4 level, however, modifications have been included so that the level of difficulty can easily be adapted.

Modelled/Guided Problem Solving

This component of the Balanced Math Program gives teachers the opportunity to focus on a different small group of students each day of the five day Balanced Math Rotation. The Modelled/Guided Problem Solving group is four to five students working closely with the teacher to solve a problem, explore a new mathematical manipulative, take up a math test, or learn a new math game. The teacher can use this time to model and guide students through the steps of problem solving, the different problem solving strategies and the use of manipulatives. The implementation of the Modelled/Guided group provides quality instructional time which benefits both the students as well as the teacher.

The teacher has the opportunity to interact with each student in the class on a regular basis and is therefore able to gain a true sense of student understanding. This enables the teacher to adapt instruction to the student needs. Each student receives