

IMP – MiC Integration

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From: *MiC Integration with the Interactive Mathematics Program*

This is a selected list of Math in Context units with the concepts each unit shares with IMP. Although the idea is that all students have these experiences in the middle school, this may serve as a Pre-IMP package of materials for low-performing 9th grade students where Math in Context was not used previously. (In this case, the order would be reasonable. However, **Picturing Numbers** and **Grasping Sizes** could be use as a lead-off, since they primarily involve number and have little dependence on the others.)

These units were chosen for the Pre-IMP package because they will provide a sound, intuitive foundation for the concepts involved in the first year of IMP (namely, *Patterns*, *Overland Trail*, and *The Pit and the Pendulum*). Some of the MiC materials begin a formalization of concepts; a more complete formalization would be expected in the following years.

Patterns and Symbols covers three concepts from the list for IMP 1.

1. Use variables to express generalizations.
2. Find, analyze, and generalize geometric and numerical patterns.
3. Use a concrete model to understand and do arithmetic with positive and negative integers.

Expressions and Formulas covers four concepts from the list for IMP 1.

1. Analyze and create in-out tables.
2. Work with order of operations rules for arithmetic.
3. Develop numerical algorithms for problem situations.
4. Express algorithms in words and symbols.

Comparing Quantities covers three concepts from the list for IMP 1.

1. Compile and organize data.
2. Use multiple representations (graphs, in-out tables, and algebraic relationships) to describe situations.
3. Solve problems involving two linear conditions.

Picturing Numbers covers two concepts from the list for IMP 1.

1. Compile and organize data.
2. Make graphs from tabular information.

Grasping Sizes covers three concepts from the list for IMP 1.

1. Find numbers that fit several conditions.
2. Make estimates and plans for various situations.
3. Quantify graphs with appropriate scales.

Statistics In the Environment covers two concepts from the list for IMP 1.

1. Interpret ambiguous problems.
2. Collect and analyze data.

Insights into Data covers nine concepts from the list for IMP 1.

1. Use tables of information and lines of best fit to make predictions and estimates.
2. Interpret graphs intuitively, and use graphs intuitively to represent situations.
3. Find lines of best fit intuitively.
4. Solve equations for one variable in terms of another.
5. Plan and perform controlled scientific experiments.
6. Collect and analyze data.
7. Express experimental results and other data using frequency bar graphs.
8. Fit a function to data using a graphing calculator.
9. Make predictions based on curve fitting.

Building Formulas covers two concepts from the list for IMP 1.

1. Interpret algebraic expressions in words using summary phrases.
2. Develop meaningful algebraic expressions.

Graphing Equations covers four concepts from the list for IMP 1.

1. Use graphs to represent equations, and write equations that describe graphs.
2. Use the point of intersection of graphs to satisfy two conditions.
3. Work with rate problems of various types.
4. Solve equations for one variable in terms of another.

Growth covers two concepts from the list for IMP 1.

1. Use graphing calculators to explore the graphs of different functions.
2. Fit a function to data using a graphing calculator.

These next units involve only one of the expressed concepts, some in conjunction with others in the above list. If one were teaching a Pre-IMP course and chose to skip an entire unit from the above list, sections could be selected from these units to strengthen the foundation for the listed concepts. However, students using MiC in the middle school would complete several, if not all, of these units, and therefore, would be even more prepared for IMP.

Rates and Ratios with **Graphing Equations** share this concept.

Work with rate problems of various types.

Figuring All the Angles

Work with geometric concepts including angle and polygon.

Patterns and Figures with **Patterns and Symbols** share this concept.

Find, analyze, and generalize geometric and numerical patterns.

Packages and Polygons

Work with geometric concepts including angle and polygon.

Decision Making

Create examples that fit a set of constraints.

Per Sense with **Grasping Sizes** share this concept.

Make estimates and plans for various situations.

Tracking Graphs with **Insights into Data** share this concept.

Interpret graphs intuitively, and use graphs intuitively to represent situations.

Made to Measure

Recognize the phenomenon of measurement variation.