

# Production of Stories

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### Third Grade Lessons

1. **Comparing Different Functions** - The students will discuss, represent, and solve a verbal problem involving the choice between two functions.
2. **Comparisons and Attributes** - Work with comparisons and comparison operators ( $=$ ,  $<$ ,  $>$ ).
3. **Functioning Together** - Students work together to develop multiple representations of a function. The students split up into groups of three with each student having a separate responsibility. When all the input values have been used up, the students are asked to, together, make up a story that describes their function.
4. **Functions - Earning Money** - The students will create tables and equations from given stories. The functions are additive and multiplicative.
5. **Functions from Tables** - Students work with a function, beginning with a table and then a formula, to generate ordered pairs that follow the rule of the function.
6. **Interpreting Graphs** - Students will be given two linear distance-time graphs and asked to tell a story about each graph and to compare them. They will later explore comparisons between points in each line.
7. **Interpreting Maps** - Students construct a narrative of a trip, given a simplified map and a table of arrival and departure times. They also determine how much time was spent along each segment of the trip (and how much time was spent at each place along the way.) If time permits, they construct a table ordered by time, showing the duration of each segment and the accumulated times.
8. **Number Line - Locations** - Students place themselves at points on the number line. Main contexts: stairs, age, money, temperature, and pure number.
9. **Symbols** - Discussion about what symbols are; writing messages or "stories" with symbols; interpreting symbols.

### Fourth Grade Lessons

1. **Comparing Strips of Unmeasured Lengths I** - The class is the first of a series that will focus directly upon the algebraic representation of measurements and their multiplicative relations. Children are asked to compare the lengths of strips, to describe the relationships between them in multiple ways, and to demonstrate that the relationships they represent are true.
2. **Comparing Strips of Unmeasured Lengths II** - The class is the second of the "Strips of Unmeasured Lengths" series that will focus directly upon the algebraic representation of measurements and their multiplicative relations. Children are asked to compare the lengths of strips, to use algebraic notation to describe the relationships between them, and to demonstrate that the relationships they represent are true.
3. **Comparing Strips of Unmeasured Lengths III** - This is the third lesson in the "Strips of Unmeasured Lengths" series that focuses directly upon the algebraic representation of measurements and their multiplicative relations. We will work with the relationship  $B = 3S$ , focusing on equations and their verbal descriptions and on true and false equations and statements.
4. **Evaluation Problem** - Students will be given a problem that asks about the amount of money each person has, based on the amount in a piggy bank. They will be given one graph and asked to draw the second graph.
5. **Fourth Grade Assessment III** - This is a written assessment where children will be asked to interpret graphs and to interpret and determine the truth or falsehood of equations and statements that describe comparisons between quantities.
6. **Fourth Grade Assessment IV** - This is a written assessment where children will compare two students. One of the students' speed can be represented linearly while the other's speed is represented by a non-linear graph.
7. **Multiplicative Candy Boxes I** - This class centers on the possible amounts of candies two children, Juan and Marcia, have. Juan has a box of candy and Marcia has twice as much candy. What are the possible amounts of candies they might have?
8. **Running Race I** - Compare a race between two students: one who runs at a constant pace, the other who tires out as the race proceeds.
9. **Two Phone Plans II** - Students will work on the comparison between two phone plans (also used in the lesson "Two Phone Plans I"), one of which has a lower rate, but a monthly basic charge, the other has a higher rate but no basic charge.
10. **Varying Speed** - Children are asked to tell a story about a trip depicted through a graph that has varying slopes/speeds.
11. **Varying Velocity** - Children are asked to tell a story about a trip depicted through a graph that has varying slopes/velocities.

### Fifth Grade Lessons

1. **Basic Function Shapes** - In this lesson, the students will (a) discuss, represent, and solve a verbal problem involving the choice between two functions; (b) choose, among 8 basic graphs (7 distinct shapes), the one that matches specific situations; and (c) write stories to match a specific graph shape.
2. **Review on Graphs and Equations** - In this lesson, the students will solve individually or in small groups the set of problems. For each problem, the teacher will lead a discussion based on the students' work (the teacher should identify strong and weak points in the students' work). The class is organized around four main problems. Within each problem students will answer different questions.

### Middle School Lessons

1. **Who Shares My Function? - Linear with Graphs, Tables, and Equations** - Students will make groups by finding other students who have the same linear function, as shown in representations of graphs, tables, or equations. They will then generate a story to go with the function.
2. **Who Shares My Function? - Linear with Negative and Fractional Slope** - Students will find other functions that are the same as theirs, starting from a table, a graph, or an equation. Once they have identified the same function represented in a different way, they will create a story that describes all of the different representations of the same function.