Accelerated Reader

Lesson Setup

Real-World Context	Possible Math Tools
Many students have goals for the number of words they need to read by the end of the year. Such large numbers may feel daunting, and so scheduling reading time to meet that goal can be helpful in showing the students it is something they are capable of. Students should answer the following questions: • How much am I reading? Is it less than I thought? • What would I have to do to become a "reading millionaire" (read 1,000,000 words in a semester?)	3 – 5 students: • **Arithmetic:** Repeated addition, multiplication, and division • **Number Sense:** Estimation, approximation, rounding, place value to 1,000,000 • **Measurement & Data:** Averaging, rates, obtaining and representing data

Possible Learning Objectives:

Students take data to determine their reading rates. They estimate from the data (provided or taken) reasonable values for their model.

Cross-curricular Connections:

Students can obtain data from reading assignments, either classroom work or homework.

Materials List:

Timers, pencils, paper; monthly and yearly calendars with school holidays marked

Additional Notes:

This lesson can be done in a week depending on class abilities and period length. While it could remain a short activity, there are many opportunities to extend it throughout the year with continued data taking and revisions to the student's plans based on their changing reading rates or unexpected trends in their free time distribution. This lesson focuses on the "Doing the Math" part of the modeling process. It is more closed at the beginning and end, as there is a well-defined product that comes out of this lesson.

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Anticipate:

Where might students go with the provided context?

These questions are adapted from the GAIMME report – Guidelines for Assessment and Instruction in Mathematical Modeling Education. You can freely download the report here: http://www.siam.org/reports/gaimme.php.

What questions might students ask to **define a focused problem** from the broader real-world context?	How many pages will I have to read per night if I only read on weeknights? How can I estimate my reading rate quickly and easily? Does reading different books change my reading rate?
What **information** might students need, and who will provide/find that information?	Students should use basic statistics (mean, median, or mode) to determine the words per page of books they plan to read. They should also count how many days they have to read, and gather data about reading rates through experimentation. This information should **not** be obtained online because this lesson focuses on doing the math and letting students figure out what they need to know.
What **vocabulary** should students learn before they begin the task?	Terms for measurement of time (including "semester" or "quarter") and mathematical terms like "rate" and "data table."
What **assumptions or generalizations** might students make using the information they have?	Students may assume that words per page can be found by taking data from a representative sample. They can also assume that their reading rate is constant and reading time won't change drastically over the course of the year. If student schedules do change, allowing reading time to increase or decrease, encourage students to revise their models.
What **mathematical tools** might your students gravitate towards?	Students are likely to use basic statistical representations and estimation to guess how many pages a million words are in. Some students may find it easier to do repeated addition rather than multiplication.
Which parts of the modeling process should happen in **small groups** and which with the **whole class**?	Each group should gather data and do the math on their own. Only the presentations should be done with the whole class.
How will students **record** their ideas? In what format will they **present**?	Students should record a plan for their reading and how many words/books they'll read. The plan might be presented as an outline or marked on a calendar or planner.