



# Math Fundamentals PoW

The Math Forum's Problems of the Week provide non-routine constructed response problems. The Math Fundamentals problems target concepts typically learned in grades 3-5. Memberships and mentoring options are available at the individual, class, school, and district levels.

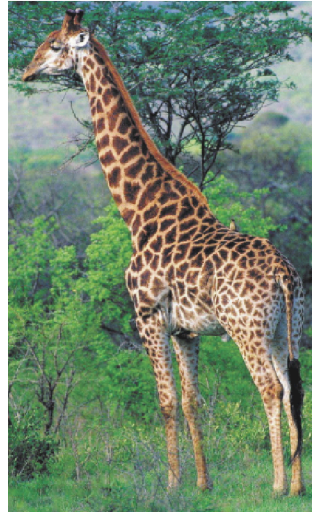
## Zoo Train - to be posted May 1, 2006

The zoo has a train that carries people between exhibits. One morning the first passengers got on at Monkey House. At Alligator Pond the number of people who got on was 3 more than got on at Monkey House.

The train made 4 more stops at Tiger Thicket, Panda Playground, Giraffe Savannah, and Big Cats. At each of these stops, 3 more passengers boarded the train than at the previous stop. At Big Cats 20 people got on the train.

How many passengers in all boarded the train?

**Extra:** What is the minimum (fewest) number of train cars that it would take to hold all those passengers at once, if each car holds 12 passengers?



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Learn more about the Problems of the Week at <http://mathforum.org/pow/powcharges.html>

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Win a t-shirt! In order to enter the drawings for t-shirts, write your answer and an explanation of your solution on this sheet, fill out the green entry card, and staple them together. Return it to Booth 630.

# The Math Fundamentals Problem of the Week Scoring Rubric

A full-page version of this file is available to the public via the Scoring Guide link at <http://mathforum.org/funpow/>. Problem-specific scoring rubrics, as well as “Expected Solution” documents, are available to Teacher Members who choose to mentor their students’ work using our online environment.

For each category, choose the level that *best describes* your work

	Novice	Apprentice	Practitioner	Expert
<b>Problem Solving</b>				
<b>Interpretation</b>	I do not understand much of the problem.	I understand some of the math in the problem.  I completed part of the problem.	I understand all of the math in the problem.  I attempted all parts of the main problem.	I understand the Extra question and solved it correctly (and am at least a Practitioner in Strategy).
<b>Strategy</b>	I do not know how to set up the problem.	My strategy made sense, but it isn't enough to solve the whole problem.  My strategy relied on luck.  My approach wasn't systematic.	I picked a good strategy.  I solved the problem through skill, not luck.  My approach was systematic.	I used two separate strategies <i>or</i> I used an unusual or sophisticated strategy.
<b>Accuracy</b>	I think I made many errors.	Most of my work is accurate. I may have one or two errors.  I didn't use correct units.	My work is accurate and contains no arithmetic mistakes.  I used appropriate units.	[not possible for most problems]
<b>Communication</b>				
<b>Completeness</b>	I wrote very little to explain how I solved the problem.	My explanation does not include calculations. <i>or</i> I did not explain why I did my calculations.  I didn't explain why I did several steps.	I explained almost all of the steps taken to solve the problem.  I explained how I came up with my equations, expressions, and calculations.	I included some special ideas and/or patterns I discovered about the problem.
<b>Clarity</b>	My explanation is very difficult to read and follow.	My explanation isn't entirely unreadable, but another student wouldn't be able to follow it easily.  My spelling and typing errors make my explanation hard to understand.	Another student would be able to read and understand my solution.  I used correct math language.  I tried to use good grammar, spelling, organization, and typing.	My answer is very readable and it looks good!  My organization makes my ideas especially clear.
<b>Reflection</b>	These items are reflective:	I showed how I checked my own answer.  I explained why my answer is reasonable.  I suggested a hint that I would give to another solver.	I connected the problem to another problem or experience.  I explained where I'm stuck.  I summarized my process.	I explained why I think the problem is easy or difficult.  I <i>revised</i> and improved my work.
	I did nothing reflective.	I did one reflective thing.	I did two reflective things.	I did three or more reflective things or I did a great job with two of them.

## Teacher Support for Zoo Train

Each Current Problem of the Week (and consequently many in the library) includes a list of topics, pointers to related resources, and NCTM Standards correlation. This table is adapted from the full online Teacher Support page for this problem that includes links for all of the resources. These pages are available to members at <http://mathforum.org/pow/support/>.

Topics	Problems Library	NCTM Standards - Grades 3-5	Math Tools
addition algebraic reasoning more than patterns sequences	FunPoW: Eating Grapes PreAlgPoW: A Cranberry Craving	Number and Operations Algebra Reasoning and Proof Problem Solving Communication	Math 4: Operations with Numbers Math 4: Patterns
Other Resources	Ask Dr. Math	Teacher2Teacher	...and more!
I've Got Your Number Practicing Arithmetic Skills	Describing Patterns Describing Patterns in Sequences	Predicting Terms in a Sequence	