

## New features in Problem-Attic – Nov. 2013

This document explains some recent changes to Problem-Attic. Here is a brief summary:

- **CCSS math revision.** Approximately 3000 new or edited questions and 1000 pictures. More questions written with context and multiple steps (please see attached samples). Improved pairing of free-response.
- **Sort button for CCSS math.** On the Select pages, you can view questions from easiest to most difficult, or vice-versa.
- **Scoring App now supports free-response.** You can mark answers as correct/incorrect and override the scores for individual students and questions.
- **Two new fonts.** Create PDFs, online tests and slideshows with fonts that are similar to Verdana and New Century Schoolbook\*.

**Important:** Some of the new options are for individual and school subscribers only. For all users of Problem-Attic, the options are available for trial in the Play Area.

Below you will find details about each new option and screenshots that relate the information to the website.

### **1** CCSS math revision

We're continuing to improve our questions for Common Core math. The database has grown slightly to 23,000 questions for grades 3–8 and high school. (Grade 1 and 2 coverage is coming soon.)

As part of the update process, we cut around 1000 questions, added 1500, and edited another 2500. Technically speaking, the cuts are still in the database, so they'll show up in any documents that contained them. But otherwise they're hidden and no longer counted toward the total.

Most of the changes are meant to increase the rigor of the CCSS math database and to make more of the material "contextual". The attached pages show the kinds of questions that we're producing. Please take a look. They all come from the CCSS math database and, in a sense, they're all new. (Some were in there previously as single-step questions or were written without any real-life context.)

Sample question #2 is worth singling out. In the prior version of CCSS math, it was a lower-level question that asked students to locate a point on a grid. In the current version, it's actually written as a multiple-choice question. But it doesn't have to be delivered to students that way. Problem-Attic has an option for hiding choices, or turning constructed-response into free-response. We took advantage of that option when we created the sample pages.

Question #2 can also be turned into a multi-step question or task. Using the editor in Problem-Attic, you might want to ask some follow-up questions or extend the idea. (Hint: if you make a question multi-step, use the labeling option called “subparts” for best appearance.) Given the marching scenario, a nice open-ended task might be to have students write instructions that produce a geometric shape or go from one point to another on the grid in  $x$  number of moves.

In the CCSS math database, about 5% of the questions are similar to those on the attached pages. While that may seem like a small percentage, it’s actually a sizeable number, about 1200 out of 23,000. We’ll keep working to increase that percentage and make it easier to locate certain kinds of questions in the database. In case you didn’t know, Problem-Attic already has an option for filtering questions (see “New features – September 2013”). And we just added a Sort button that puts multi-step questions and tasks at the top.

One last note about the CCSS update: along with the re-written questions are more than 1000 new and improved pictures. Scatterplots, which are generally found in grade 8, are almost all re-drawn with more realistic data points and labels. In other places we improved the accuracy of pictures and made their size and font style more consistent. We’ll continue making these sorts of improvements in the months ahead.

## **2** Sort button for CCSS math

In October we announced a new Sort button which appears on the Select pages for NY Regents and Academic Competitions. This button changes the order of problem “thumbnails” from oldest to newest, or vice-versa.

Now the Select pages for CCSS math have a similar button. (See figure on next page.) Rather than sorting by *date*, this new button sorts by *level of difficulty*. By default, problems go from easiest to most difficult. To reverse the order, click the Sort button ❶. If you want to check on the current sort order, hover for a second or two and a message will appear ❷.

Please note that sorting by difficulty is not exact. Many Common Core standards have subtopics, and to preserve logical groupings, we sometimes have to go back-and-forth between easier and harder problems. Generally speaking, with the default sort, problems will get more difficult as you scroll down a page, or click on a subsequent page, and free-response will be at the end. But we still recommend viewing several pages and using the Filter button to get a good idea of what’s available for a particular standard.

1

Problem-Attic

Sort by difficulty, currently easiest on top

Select Arrange Format Preview Filter Add

Mathematics grade 3 through HS / 8.NS.1

Consider the following numbers:  
 $\pi$ ,  $\sqrt{49}$ ,  $0.2\overline{87}$ ,  $\sqrt{\frac{9}{16}}$ ,  $-\sqrt{25}$

How many of these numbers are *rational*?

a) 1      b) 2      c) 3      \*d) 4      e) 5

Edit Add

2

Problem-Attic

Sort by difficulty, currently hardest on top

Select Arrange Format Preview Filter Add

Mathematics grade 3 through HS / 8.NS.1

The decimal  $0.297297\dots$ , in which the sequence 297 repeats endlessly, is rational. Show that it is rational by writing it in the form  $\frac{p}{q}$  where  $p$  and  $q$  are integers.

Edit Add

### 3 Scoring App: support for free-response

The Scoring App, which was originally designed for multiple-choice questions, now has excellent support for free-response. This support is on two levels: automatic scoring when possible, and options for manual scoring (or overrides) when answers are lengthier or more complex.

On the surface, the Scoring App looks and runs exactly the same as before. The differences are on the Student tab after you collect results.

Problem-Attic

Scoring App

On Turn Off Submissions (0) Clear Print Download Email

Document: Pop Quiz #3  
 ID: nm7msnw [View Links](#)  
 Problems: 6

When student clicks Submit button:

Capture results here (scoring app)  
 Show results to student  
 Email me the results

Student start page  
 (click QR code to enlarge)

On the start page, students should:

- be given an answer sheet
- take an online test (view questions)
- select answer sheet or online test

Class Student Problem

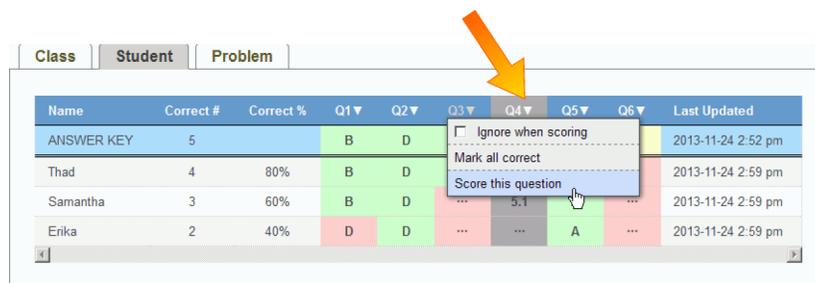
Name	Correct #	Correct %	Q1	Q2	Q3	Q4	Q5	Q6	Last Updated
ANSWER KEY	6		B	D	supplementary	5.2	A	---	2013-11-24 2:05 pm

1 2 3

On the Student tab, the second row shows correct answers. See previous figure for an example.

- If Problem-Attic can score a question, and if the multiple-choice or free-response answer fits in the column, then the answer is shown below the question number ❶.
- If a question is scoreable but the answer doesn't fit, then there will be three dots in the column. If you hover over these dots for a second or two, a message will appear with the correct answer ❷.
- If a question can't be automatically scored, the column will be shaded yellow. In that case, you'll probably want to score the question manually, mark all answers as correct, or tell the Scoring App to ignore the question ❸.

Just above the row of answers are new downward-pointing triangles. If you click on one these triangles, you'll see a menu with various scoring options.



The screenshot shows a table with columns for Name, Correct #, Correct %, Q1, Q2, Q3, Q4, Q5, Q6, and Last Updated. The Q4 column is highlighted in yellow, and a context menu is open over it, showing options: Ignore when scoring, Mark all correct, and Score this question. An orange arrow points to the Q4 column header.

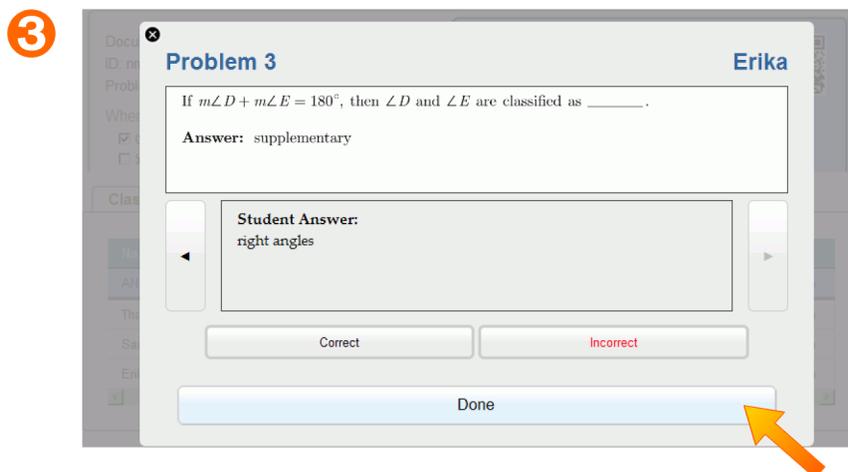
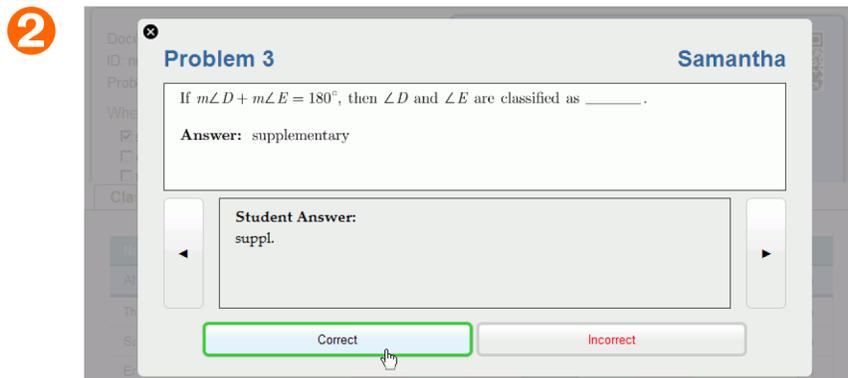
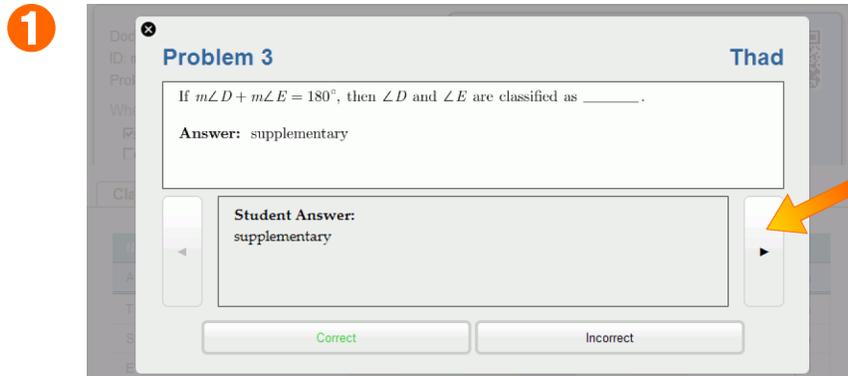
Name	Correct #	Correct %	Q1	Q2	Q3	Q4	Q5	Q6	Last Updated
ANSWER KEY	5		B	D					2013-11-24 2:52 pm
Thad	4	80%	B	D					2013-11-24 2:59 pm
Samantha	3	60%	B	D					2013-11-24 2:59 pm
Erika	2	40%	D	D			A		2013-11-24 2:59 pm

Here's a description of the options:

- Ignore when scoring. If you select this option, the Scoring App will not mark the answer and will not count the question toward the total. This effectively reduces by one the number of questions on your test or quiz.
- Mark all correct. If you select this option, all answers in the column will be marked correct. This usually has the effect of raising student scores.
- Score this question. Choose this option if you want to mark each student's answer as correct or incorrect, or override the automatic scoring of multiple-choice or free-response. See next section for details.

#### 4 More details about “Score this question”

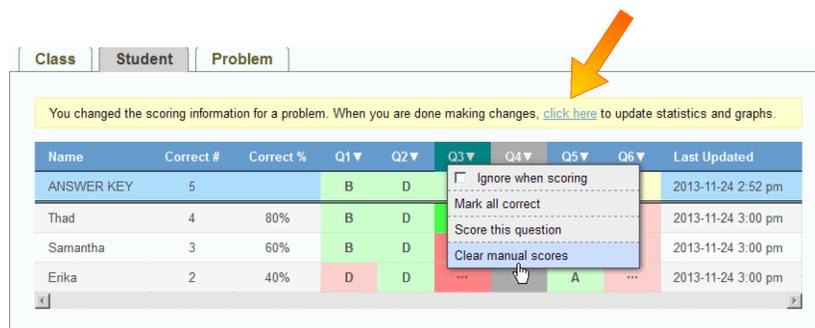
If you wish to score a question manually, or override the automatic scoring for an individual student or question, click the downward-pointing triangle at the top of Student results. Choose the option called “Score this question.” A dialog will pop up which shows the question, the correct answer, and the answers submitted by students. As you advance through the submitted answers, you mark them correct or incorrect, then click the Done button.



If Problem-Attic can score a question, then it will be marked **Correct** or **Incorrect** for each student. (See previous figure.) If you agree, then you can click the Right Arrow and continue on to the next student ❶. If no answer is marked, or if you want to override the automatic scoring, then you can click the Correct or Incorrect button ❷. Either of these two buttons will take you to the next student; you don't have to press the Right Arrow afterward.

When you reach the last student, you'll see a Done button ❸. Press this button to close the dialog. The Scoring App will refresh all data, including graphs and statistical information.

After going through the dialog, you'll notice a new option in the drop-down menu at the top of the question/answer column. The option is labeled, "Clear manual scores". Choose this if you want to undo or cancel your correct and incorrect marks. Any automatically-generated marks will be restored.



Note: For certain options in the drop-down menu, the Scoring App will not automatically refresh. This is to prevent the re-loading of pages if you're making several changes at once. The Scoring App will, in such cases, remind you that you need to do a manual refresh. Simply click the link in the yellow box when you are ready to update graphs and statistical information.

## 5 How the Scoring App marks answers

At this time, only a few types of answers can be automatically scored. All other answers—that is, student submissions—must be scored manually if you want accurate statistical information for a class, student or problem.

Here are the types of problems/answers that can be automatically scored:

- Multiple choice answers. Normally these are upper- or lowercase letters in the range A–J. The Scoring App knows what to do with them *if a problem contains a multiple-choice group*. This is a special kind of ordered list. It shows up in Problem-Attic's editor as a yellow box, and it's activated through the list icon in the toolbar. For more information about creating a multiple-choice group, please see online help.

- Numeric answers. These are numbers consisting of one or more digits, an optional decimal point, and an optional leading minus sign (i.e, for negative numbers). No fractional, radical or exponential notation is currently recognized, nor is any unit or the percent symbol—but we’re working on it.
- Text strings containing ordinary keyboard characters, including punctuation and spaces. The Scoring App does a literal string comparison. The comparison is *not* case-sensitive, but otherwise there must be an exact match for an answer to be marked correct. For that reason, automatic scoring is usually unreliable for more than one or two words. Anything longer which tempts students to use abbreviations or which could include misspelled words will almost certainly require manual scoring.

Besides the above limits with the Scoring App, there are practical limits on the student side. For smartphones and tablets, keyboarding can be difficult. At this time, we recommend using the Scoring App for multiple-choice, numeric and one- or two-word answers only, unless students will take an online test or see an answer key on a desktop computer (or use a handheld device with a separate keyboard).

## **6 Two new fonts**

Last but not least, we’ve added some new font choices to Problem-Attic. Many users requested that we support the same fonts as on their state assessments, so we added look-alikes for Verdana and New Century Schoolbook\*. In the program, these are called “Fortuna” and “Century”.

At the same time, we changed Serif, Sans Serif and Block Serif to more recognizable font names. They are now called, respectively, Times, Helvetica and Charter.

Here are samples of the five fonts now supported by Problem-Attic:

Times	Typographia Ars Artium Omnium Conservatrix
Helvetica	Typographia Ars Artium Omnium Conservatrix
Charter	Typographia Ars Artium Omnium Conservatrix
Fortuna	Typographia Ars Artium Omnium Conservatrix
Century	Typographia Ars Artium Omnium Conservatrix

Whatever font you choose for your current document will be used for all output: a PDF file, online test or slideshow.

Thank you for using Problem-Attic. Please send any comments or suggestions to **support@problem-attic.com**.

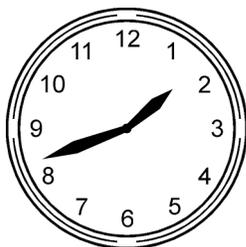
Note: If you have a printout of this document and would like an electronic copy, you can download it from **www.problem-attic.com/resources/new-features-Nov-2013.pdf**.

\*Verdana is a registered trademark of Microsoft Corporation, and New Century Schoolbook is a trademark of Linotype GmbH.

## Sample CCSS Math Questions from Problem-Attic

- 1 The first clock shows when recess begins and the second clock shows when recess ends.

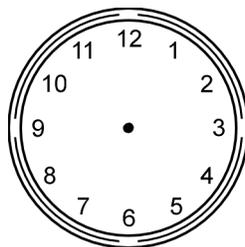
Recess begins



Recess ends



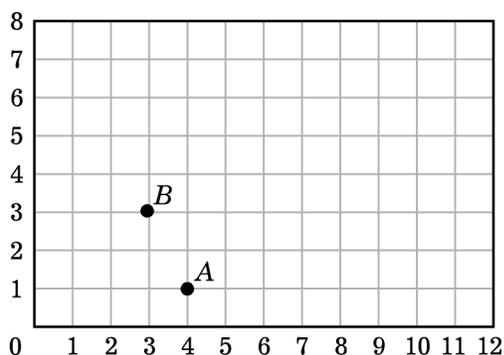
School ends



How many minutes long is recess?

The school day ends 1 hour and 20 minutes after recess. At what time does school end? Show your answer on the clock.

- 2 Belinda plays trombone in a marching band. The grid below represents a football field, where she has to march into different positions.



Belinda writes down instructions like this in her sheet music:

**move 2U-1L**

The numbers tell her how far to march and the letters tell her the direction: Left, Right, Up or Down. For example, after following the instructions above, Belinda goes from point A to point B on the grid.

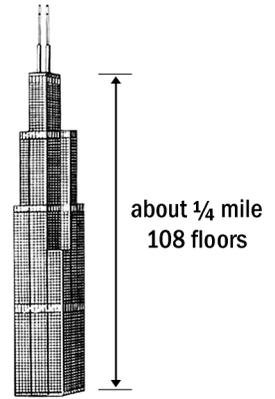
Belinda is now at point B. If she is given the following instructions, where will she end up on the grid?

**move U1-R4-D3-R3-U4**

3

One of the tallest buildings in the world is the Willis Tower in Chicago. (It used to be named the Sears Tower.) There is an observation deck at the top which is approximately one-quarter mile above the ground. How many feet is that?

People argue about how many floors are in the Willis Tower. It has 108 floors when counted by a standard method. It has 110 floors when the roof and a mechanical platform are included. Using either number, calculate the average distance from one floor to the next. If you round your answer to the nearest tenth of a foot, does it matter whether you use 108 or 110 floors in your calculation? Explain.



4

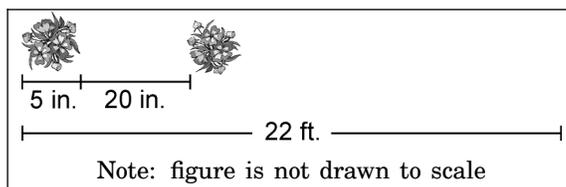
Dihanne is running a one-mile race. At the halfway point, she takes the lead over Emma.

- How many yards has Dihanne run when she takes the lead?
- 80 yards before the finish line, Emma passes Dihanne and re-takes the lead. How many *feet* from the finish line are they?
- 60 feet from the finish line, the race is too close to call—Emma and Dihanne are running side-by-side! What fraction of the race is still left?



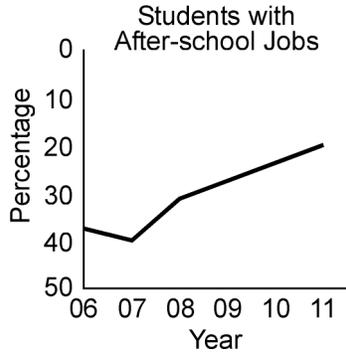
5

Mr. Duncan is planting African violets along a 22-foot path to his front door. At the time of planting, the violets are each about 5 inches in diameter. Mr. Duncan creates a pattern with 20 inches of empty space between the violets, as shown in the figure.



- Based on the pattern, what is the most number of violets that can be planted along the path?
- The pattern of violets will not exactly fill the 22-foot path. If the pattern starts at one end, how many inches of space will remain at the other end, after the last violet?
- If Mr. Duncan wants to plant the same number of violets but have no extra space at the end, how should he change the pattern?

6



Michael thinks that the number of students with after-school jobs is increasing.

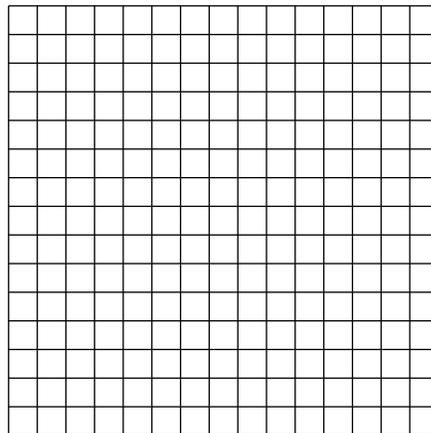
- Based on the graph, do you agree or disagree with Michael? Explain your answer.
- How does the graph misrepresent the data? Draw a new bar or line graph that more accurately represents the data.
- Based on your new graph, between what two years did the percentage of students with after-school jobs increase or decrease the most?

7

For the new school year, St. Francis High School requires every student to own a laptop computer or tablet. By switching to online homework and quiz submission, the school hopes to reduce paper usage by 30% each year. Last year, the school used 24,000 pounds of paper.

- Complete the table and construct a graph to show how paper usage is expected to decrease over the next 5 years. Be sure to label and mark your axes.

Year	Paper (lbs)
0	24000
1	
2	
3	
4	
5	



- Write an equation that shows paper usage ( $P$ ) as a function of time in years ( $t$ ).
- After how many years should paper usage fall below 1000 pounds?