

**Grade level:** 3

**Summary:**

Teachers create open-ended math questions using Dana by AlphaSmart and beam to students. Students work through each problem and use AlphaWord to write a narrative explanation of how they arrived at their answers. Then students write their own open-ended math problems and beam to each other to solve.

**Technology tools:**

Dana by AlphaSmart, iGo-Pitch Solo, Projector


**Additional resources:**

Dana by AlphaSmart Calculator application

**Step-by-step tasks:**


Preparation


1. Teachers use AlphaWord to create at least one open-ended math problem for modeling.
2. Create at least four additional open-ended math problems for collaborative group work.
3. Connect Pitch Solo to a projection device and then connect Dana to the Pitch using a standard USB cable

 AlphaSmart tip: AlphaWord allows for special characters. See the Dana by AlphaSmart User Guide, Appendix B for a list of special characters including international characters, diacritical markings and some math notation.

Activities

1. Project the open-ended math problem and model problems solving steps. Allow students time to discuss ways to solve it.
2. Once students solve the problem, launch AlphaWord and model how to write a narrative explanation of how the problem was solved.
3. Form four collaborative groups. Beam one open-ended problem to one student in each group. That student then starts a chain so all students are beamed the question.
4. Students work as a group to solve the open-ended math problem.
5. The students also use the information in the question to create an open-ended question of their own.
6. The students then beam their answers and questions to each other to check.
7. Students work together to assess each others questions and explanations for the word problems. Comments are shared through beaming.
8. Students then print their work using CreativeWriter and hand it in to the teacher.

 AlphaSmart tip: You can connect Dana by AlphaSmart directly to a USB or IrDA printer. If you do not have an IrDA printer available, you can purchase a Bachmann IrDA adapter to add this functionality. For teachers and students using Dana Wireless, you can print wirelessly to a network printer.

 AlphaSmart tip: To add more printing functionality, look in the Dana Extras folder inside the Palm folder on your computer. Open the PrintBoy folder and find the True Page drivers for your printer. Use the Install tool to HotSync True Page drivers to each Dana.

### Homework

1. Student created open-ended questions are beamed to the teacher.
2. The teacher prints the questions and hands them out for homework.

### Sample open-ended questions

1. Use the information below to help you solve this problem. If you buy 2 pencils, how much change would you get back if you pay with a one dollar bill? Would it be possible to buy two of each item if you have \$3.00? Explain your answer.

School Supplies

Crayons \$0.79

Pencil \$0.20

Ruler \$0.35

2. You and your friend go to the store to buy some food for an afternoon snack. You buy a bottle of lemonade for \$0.89, a bag of pretzels for \$1.67, and 2 apples for \$0.45 each. You must also pay \$0.16 tax. What bills and coins would you give to the salesperson to pay for the food using exact change? Show all your work and explain how you got your answer. If you paid with a five-dollar bill would you have enough money? If so what would be your change? Explain your answer.
3. You plan to buy 6 Gameboy games at either Toyland or Game World. Using the information below, determine which store offers the better buy? Explain your answer.

Toyland

Gameboy games sell for \$16 each

This week's special - buy 5 Gamboy games and get 1 Free

Game World

Gameboy games sell for \$16 each

This week's special - \$3 off regular price

### Extension ideas

1. The Dana then can be used for students to move from writing open-ended questions to writing word problems. The word problems can be beamed from student to student to solve then beamed back to correct. The final products can be sent to the word processing application on your computer and printed.
2. The Dana can be used as an assessment tool for checking students' ability to write explanations for open-ended questions.