

# Growing Minds in Math #2

## Lessons for Stimulating Thinking

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**ELE90/106307**

ISBN: 978-0-7877-2062-9

Release Date 2015

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P. O. Box 802  
Dayton, OH 45401-0802  
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The pages in this packet were originally published in  
Growing Minds, (ELE90/1063).

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Milliken Publishing Company  
Teaching and Learning Company  
Show What You Know® Publishing  
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# Teacher's Guide For "Round Ball"

## ABOUT THE ACTIVITY

"Round Ball" will probably be more appealing to your students during basketball season, but since the televised basketball season is nearly concurrent with the academic year now, it should be of interest at almost any time.

### Level 1: Determining how a team can score 42 points in a basketball game

The main problem requires only rudimentary algebra for its solution. For the first problem, there are several ways in which to arrive at a correct answer, that is, to determine how a team can score 42 points in a basketball game. The hard part of the activity is trying to calculate how many successful free throw attempts contribute to that total.

For the sake of illustration, this is one way to come up with figures in arriving at a total of 42 points:

- 12 field goals  $\times$  2 points = 24
- 3 field goals  $\times$  3 points = 9
- 9 free throws  $\times$  1 point = 9
- Total = 42 points

### Level 2: Using algebra, determine how many free throws are made

The algebra for the problem about free throw attempts is simple:

- $0.75(x) = 9$  or  $3/4(x) = 9$
- $4 \times 3/4(x) = 4 \times 9$
- $3x = 36$
- $x = 12$

### Following Through

These are some of the activities that can be administered following the completion of "Round Ball":

**Verbal-Linguistic:** Your students might want to write a short sequel about Sharon and the Dragonettes. Will she recover in time to play in the next game? Will someone take her place as the star of the team?

**Interpersonal:** Collaborations of writers or writers and illustrators can work on short stories about Sharon and the Dragonettes.

**Intrapersonal:** Students can reflect on their own athletic experiences and write anecdotes about them.

**Visual-Spatial:** Your students could be motivated to draw a picture of the ailing and anxious Sharon or of the game itself.

**Mathematical-Logical:** Other problems can be posed about the game with the Bellflowers. If the Dragonettes have a 45% average making 2-point shots and a 30% average making 3-point shots, and their total from the field was 42, how many twos and threes were made? (In the story they made 9 of 12 free throws, or 75%.)

**Naturalist:** You can ask your students whether animals regularly play games and, if so, what animals? The young of countless animals play games, of course. It is one of the main ways in which they learn.

**Bodily-Kinesthetic:** If there are basketball players in the class, they can demonstrate shooting styles. Some young players are quite articulate about the game, and showing the moves is an excellent way of allowing them to express themselves more fully.

**Targeted Learner Outcomes:** The student will:

- find at least one way in which a team scores 42 points in a basketball game
- by using algebra, determine how many free throw attempts were made by a team that makes 75% of its free throws on average

## Round Ball

**A.** The Dragonettes had just defeated the Bellflowers, but their leading scorer, Sharon Opel, was home recovering from a pulled hamstring muscle. Since the game was played away from her school, Sharon's parents had decided it would be best not to have her travel with the team but to rest her leg at home. Sharon phoned the local newspaper's sports department, but they didn't have any information about the game except that the Dragonettes had won, 42-35. That was about the average score for Sharon's team; while she was secretly a little disappointed that her teammates had done so well without her, she was delighted that they won.

As you know, one point is awarded for a made free throw, two points for a regular field goal, and three points for a shot made beyond the arc. Sharon began guessing how her team had scored 42 points. She knew that the Bellflowers were a physical team and that there probably were quite a few fouls committed in the game. With this in mind, she tried to guess how many 2-point shots, 3-point shots, and free throws were made to give the Dragonettes their 42 points. What do you suppose she guessed?

$$\text{3-point field goals made} = \underline{\hspace{2cm}} \times 3 = \underline{\hspace{2cm}}$$

$$\text{2-point field goals made} = \underline{\hspace{2cm}} \times 2 = \underline{\hspace{2cm}}$$

$$\text{free throws made} = \underline{\hspace{2cm}} \times 1 = \underline{\hspace{2cm}}$$

$$\text{Total} = 42$$

**B.** If the Dragonettes made 75 percent of their free throws, and made 9 free throws in the game, how many free throws did they attempt? Use algebra to get your answer.

$$\text{Free throw attempts} = \underline{\hspace{10cm}}$$

