

Try Your  
**THE HARDEST MATH PROBLEM**  
**GRADE 7**

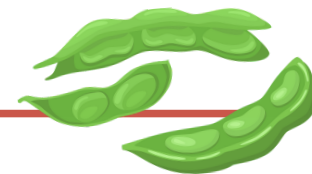
At Solutions middle School, Ms. Heim's class is branching off from the study of food webs in nature to investigate food access for humans. Her students are dismayed that food insecurity is a reality in the U.S. Two of the students, Aliza and Darius, present their research on a poster board:

- **Food insecurity** is a lack of consistent access to enough food for an active, healthy life.
- **Causes of food insecurity** include poverty, climate change, health issues, and unemployment. The COVID-19 pandemic worsened food insecurity.
- **Tens of millions of people** live in a food desert, per U.S. census data.
- **Communities respond** by providing food access through multiple pathways.

"What's a food desert?" Ji-Hoon asks.

"Great question," Aliza replies. "A **food desert** refers to an area where it's hard to find fresh, nutritious food - like vegetables, fruits, and meats - at affordable prices."

Darius adds, "Instead, food deserts tend to have processed foods that are high in sugar and fats. That's a health issue."




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### Solve the Problem

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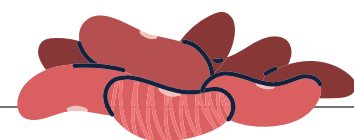
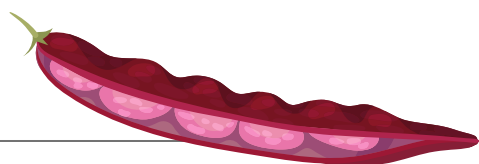
While Ji-Hoon walks home with his best friend, Camila, he wonders aloud, "Is there anything we can do **today** to help increase the amount of fresh food in our community?"

"I know!" Camila exclaims. "My uncle Nicholas runs a community greenhouse that provides fresh fruits and vegetables to families at a low cost. Let's head over there and see how we can help."

Nicolas gives the duo a tour and says, "**This year, I want to increase the total production of pinto beans by 15% . Will you help me determine how many acres of pinto beans I have to plant to reach my goal?**"

Last year, Nicolas planted 8 acres of pinto beans, and the crop yielded 2,150 pounds of pinto beans per acre. Nicolas is not sure if the crop will do as well this year. He is cautious and assumes he will only get 2,000 pounds of pinto beans per acre this year.

**SOLVE IT: Determine how many acres of pinto beans Nicolas should plant this year given his goals and expectations.** Please round all work to the thousandths place when working out solutions. Round the final answer up to the nearest half-acre.



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**CHALLENGE 1 ANSWER KEY – GRADE 7**

Although each problem has one correct numeric solution, there are multiple pathways students can take to arrive at the answer. Students who answered Challenge 1 correctly are invited to enter Challenge 2!

### Sample Solution

**Step 1:** I need to determine how many pounds of pinto beans were produced last year. Let  $b$  = pounds of pinto beans produced last year.

$$b = 2,150 \times 8$$

$b = 17,200$  pounds of pinto beans produced last year

**Step 2:** Next, I need to set up a proportion to find the pounds of pinto beans equal to a 15% increase in production. Let  $n$  = the pounds of pinto beans equal to a 15% increase in production.

$$\frac{n}{17,200} = \frac{15}{100}$$

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$$100n = 258,000$$

$$n = 2,580 \text{ pounds of pinto beans}$$

**Step 4:** Now I will get the total amount of pinto beans for this year's production goal. Let  $t$  = total pounds of pinto beans for this year's production goal.

$$t = 17,200 + 2,580$$

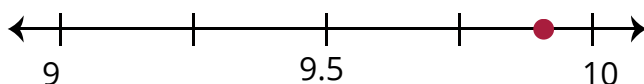
$t = 19,780$  pounds of pinto beans goal for this year

**Step 5:** Finally, I will determine how many acres to plant to get the desired yield. Let  $a$  = acres of pinto beans to plant to meet this year's production goal.

$$a = 19,780 / 2,000$$

$a = 9.89$  acres

**Step 6:** Next, I will round my answer to the nearest half-acre. The calculated value of 9.89 is between 9 and 10 acres. I need to determine if I should round the answer to 9, 9.5, or 10 acres. I will graph 9.89 on a number line to help me visualize it.



Since 9.89 is greater than 9.75, it is closer to 10 than 9.5; therefore, the answer to the nearest half-acre is 10 acres.

**Final Answer:** Nicolas should plant **10 acres of pinto beans** this year to increase his production of pinto beans by 15%.