5.NF Grass Seedlings

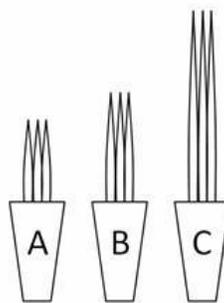## Alignments to Content Standards

- Alignment: 5.NF.B.5

Tags

• *This task is not yet tagged.*

The students in Raul's class were growing grass seedlings in different conditions for a science project. He noticed that Pablo's seedlings were $1\frac{1}{2}$ times a tall as his own seedlings. He also saw that Celina's seedlings were $\frac{3}{4}$ as tall as his own. Which of the seedlings shown below must belong to which student? Explain your reasoning.

Commentary

For the sake of this commentary, let R be the height of Rual's seedlings (of course students do not need to use a letter to represent any number in this task). Student must compare the size of each of two products ($1\frac{1}{2} \times R$, and $\frac{3}{4} \times R$) to one factor (R) on the basis of the other factor without performing any computations. An extension to this problem would be to ask students how many times larger Pablo's seedlings are than Celina's.

The wording "$1\frac{1}{2}$ times as tall" may be a clue to students that multiplication is the relevant operation (i.e., $1\frac{1}{2} \times R$ is the height of Pablo's seedlings). The student should also realize that the phrase "$\frac{3}{4}$ as tall as" also signals multiplication – in fact, this phrase can be read as "$\frac{3}{4}$ times as tall as." In both cases, a scale factor is being specified and students should connect that to the interpretation of multiplication as scaling.

The solution shown below is in adult language. Responses by fifth grade students will vary widely in their level of precision

Solutions

Solution: Multiplication as Scaling

Since Pablo's seedlings are $1\frac{1}{2}$ times a tall as Raul's, Pablo's seedlings must be taller than Raul's. Pablo's seedlings looks like Raul's seedlings scaled by a factor larger than 1.

Since Celina's seedlings are $\frac{3}{4}$ as tall as Raul's, Celina's seedlings must be shorter than Raul's. Celina's seedlings looks like Raul's seedlings scaled by a factor smaller than 1.

Celina's seedlings are shorter than Raul's and Pablo's are taller than Raul's. Thus, the seedlings in pot A belong to Celina, the seedlings in pot B to Raul, and the seedlings in pot C belong to Pablo.