

Online Tutorial Design Specification

Tutorial Title

Apple Orchard

Subject

Mathematics

Educational Level

Middle: U.S. 7th - 8th Grades
Age range: 12 -14 year olds

Number of Levels

3, Easy, Medium, Hard

Objective

The objective of this timed interactive tutorial is to understand the word problem and work through the mathematical steps to obtain the correct answer.

The secondary objective is to increase language comprehension.

High Level Summary

The player needs to determine the number of apples to be picked, pick the apples and fill the bushels before time runs out.

Format/Platform

This interactive tutorial is to be accessible and used through any Internet browser. It contains both graphical assets and a mini game. Sound is optional.

Software/Coding

Photoshop
HTML 5
Developer's Choice

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Copyright & Credits

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Player's View

First and Third Person

Scenario

Dan, Kyle, Leslie, Beth, Hector, and Courtney have to fulfill their assignment in the apple orchard on Saturday before they can go to the dance Saturday night. They each have been assigned 1 acre of apple trees. They are to pick all the ripe apples in their assigned acre.

One hundred and fifty trees grow on each acre. There are more ripe apples on some trees than on others, but on average each tree has 25 ripe apples among the dozens of green apples. A bushel will hold about 90 apples. The orchard supervisor directed them to 5 stacks of empty bushels when they checked in. Kyle quickly counted the number of bushels in one stack and scowled when the count totaled 75.

How many empty bushels should each of them take to their assigned acre?

General Tutorial Assets (.PNG and .JPG files)

At artist's discretion with credits as specified. Actual .PNG and .JPG files will be emailed upon request. Send request to sales@punaluudata.com.

Background icon:

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Hint to help solve the problem icons



Minimum Mini Game Rules

The player must successfully complete each step before being allowed to progress to the next step. If the player needs additional help, they can obtain a "Hint" that will help

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them successfully complete the step. The “Hints” for each step may be accessed by clicking on the “Hint” asset.

If the player selects “Easy”, they have 10 minutes to complete the tutorial including picking all of the apples needed to fill their bushels.

If the player selects the “Medium” level, they have 7 minutes to complete the tutorial including picking all of the apples needed to fill their bushels.

If the player selects the “Hard” level, they have 4 minutes to complete the tutorial including picking all of the apples needed to fill their bushels.

In any level, if the player picks all of their ripe apples before time runs out, they can earn two bonus Achievement Stickers by helping one of their other friends pick apples.

If the player accesses *Important Fact*, they earn one Achievement Sticker.

Mini Game

Game Set up:

Show apples “ripening” (turning from green to red) in the apple orchard. The player selects the level (Easy, Medium, Hard) they want. The player chooses the character they want to play, Dan, Kyle, Leslie, Beth, Hector, or Courtney. When the player clicks the “START” button, the clock begins to count down the amount of time they have left in the game.

Equation: $(T \times A) / C = B$
Solve for B

Important Fact:

In algebra, the order of operations means solving first for exponents or roots, then multiplication, division, addition, and last for subtraction. The steps for the order of operations also require attention to mathematical grouping symbols, such as parentheses and brackets.

Important Fact:

Algebraic expressions are the use of symbols in place of numbers. An algebraic expression uses Arabic numerals, literal numbers, the signs of operation, etc.

Step 1:

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$$T \times A = y$$

Step 1 Hint: List all of the relevant knowns to determine approximately how many apples you will have to pick:

Y = Total number of apples per acre

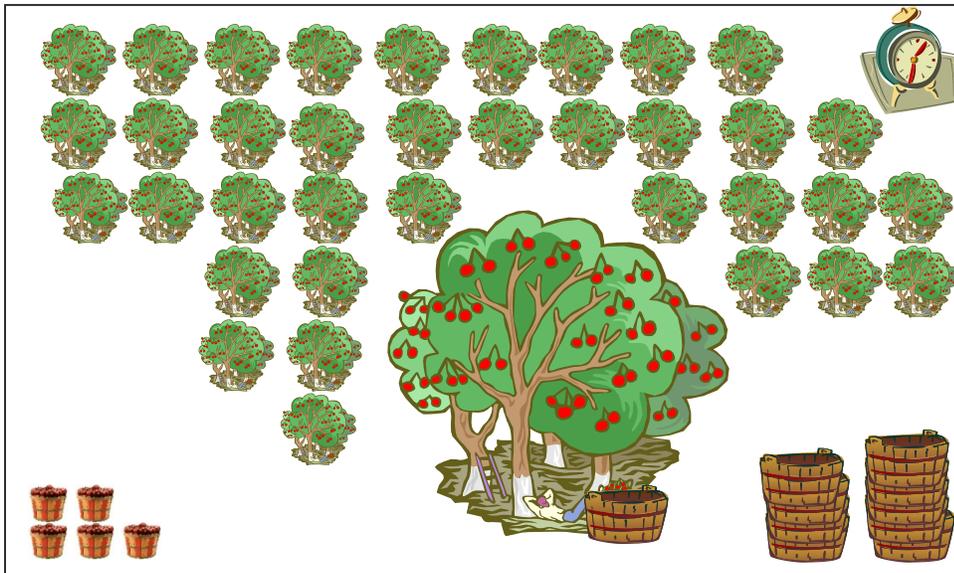
Trees (T) = 150

Average # ripe apples per tree (A) = 25

Step 2:

The player has solved the equation correctly if they move 42 empty bushels from the stacks of bushels to their acre.

The player is still racing the clock as they must now pick apples to fill their bushels. Here, the game becomes somewhat random. As one tree's ripe apples are picked, the next tree appears with more or less ripe apples than the prior tree(s). Apples that fall on the ground must be moved into the bushel to be counted. As each bushel is filled, the filled bushel will appear on the left side of the screen as seen on the following game concept screen.



Important Fact:

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You have used a problem solving plan. You first read and understood the problem. Next you devised a plan which means you translated the problem into an equation. Then you solved the equation. Finally you checked to make sure your answer was correct.