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| **Type POS Math descriptor here** | **=** | | **Choose level of accuracy appropriate to limitations on measurement when reporting quantities** |
| **Program Task:** Enter POS task here. | | **PA Core Standard:** CC.2.1.HS.F.5  **Description:** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. | |
| **Program Associated Vocabulary:**  ENTER PROGRAM VOCABULARY HERE | | **Math Associated Vocabulary:**  Rounding, Place value, mental math, average | |
| **Program Formulas and Procedures:**  Display program example of math concept by entering text, graphic, and formulas in this column. | | **Formulas and Procedures:**  It is often more practical to use estimation to solve problems, using mental math, so that a calculator is not necessary. Usually the situations presented require you to either round to the nearest whole number, tens, hundreds, or thousands, or require you to take an average of the range of numbers given. The two examples below demonstrate specific situations where rounding and averaging are useful.  **Rounding:**  Henry just purchased a cell phone plan that will cost him $38.99 per month. His friend, Elizabeth, just purchased a cell phone plan that will cost her $59.99 per month. Estimate how much more money Elizabeth will spend on her cell phone plan in one year.   1. To estimate, round to the nearest tens. Henry will spend about $40/mo. and Elizabeth will spend $60/mo. 2. Take the difference between the two: $60-$40=$20 to determine how much more Elizabeth will spend in one month. 3. Multiply by 12. $20 x 12 = $240 more per year.   **Averaging:**  Billy notices that 4-6 cars pass by his house each hour. Estimate the number of cars that will pass by his house in 8 hours.   1. Find the average of 4 and 6. Average = (4 +6) ÷ 2 = 5 2. Multiply this by 8 hours: 5 x 8 = 40   Approximately 40 cars should pass by his house. | |

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| **Instructor's Script – Comparing and Contrasting**  The Math or program area instructor should fill in this area by comparing academic math problems to lab area problems. The instructor should describe ways that trade math is similar to or different from the academic math that occurs in the PA Core Math standard or on Keystone related exams. |

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| **Common Mistakes Made By Students**  Problems arise when the students do not consider the limitations of estimating and how the situation determines when to estimate. For instance, it is not okay to round up 85 psi to 100 psi. However, if a faulty component will cost the customer $85, it would be okay to round it to $100 when estimating the cost. |

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| **CTE Instructor’s Extended Discussion**  The CTE instructor may add comments here describing the importance of this math skill in relationship to the program task, or note common problems which students have when making the computations. |

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| **Problems Career and Technical Math Concepts Solutions** | |
| 1. Program relevant problem | Allow work space here |
| 1. Program relevant problem | Allow work space here |
| 1. Program relevant problem | Allow work space here |
| **Problems Related, Generic Math Concepts Solutions** | |
| 1. A software support contract is quoted for one or two years. One year would cost $795, but two years would cost $1,495. Round each price to the nearest hundred dollars and estimate the savings for a two year commitment. |  |
| 1. Students want to raise $500 for a field trip. With fundraising, they collected $127 on Monday, $130 on Tuesday, $84 on Wednesday, and $90 on Thursday. Approximately how much money will they need to collect on Friday to reach their goal? |  |
| 1. A car can be rented for $37.99/day plus $0.39/mile. Which of the following is the best estimate for the cost of renting the car for 4 days if you are driving 100 miles? 2. $150 3. $160 4. $200 5. $250 |  |
| **Problems PA Core Math Look Solutions** | |
| 1. A company is offering a salary of $48,500 per year. If 20% is taken from taxes, how much will a person have made in 5 years after taxes? |  |
| 1. Every hour, the store sells between 40-50 items that range from $1.99 - $7.99. What would be a good estimate for the amount of money the store generates in a 10 hour day? |  |
| 1. Two friends went to dinner. Their bill came to $37.79. If a fair tip is between 15 and 20 percent, what would be a fair tip to leave their waiter? |  |

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| **Problems Career and Technical Math Concepts Solutions** | |
| 1. Program relevant problem | Provide answer here |
| 1. Program relevant problem | Provide answer here |
| 1. Program relevant problem | Provide answer here |
| **Problems Related, Generic Math Concepts Solutions** | |
| 1. A software support contract is quoted for one or two years. One year would cost $795, but two years would cost $1,495. Round each price to the nearest hundred dollars and estimate the savings for a two year commitment. | Rounding: One year ≈ $800, while two years ≈ $1,500.  $1,500/2 = $750 per year  $50 per year savings, or a $100.00 savings for the two year commitment. |
| 1. Students want to raise $500 for a field trip. With fundraising, they collected $127 on Monday, $130 on Tuesday, $84 on Wednesday, and $90 on Thursday. Approximately how much money will they need to collect on Friday to reach their goal? | Rounding the amounts to the nearest ten,  130 + 130 + 80 + 90 = 430  500 (their goal) – 430 (the approx. amt. collected) = $70 is approximate amount they would need to collect on Friday |
| 1. A car can be rented for $37.99/day plus $0.39/mile. Which of the following is the best estimate for the cost of renting the car for 4 days if you are driving 100 miles? 2. $150 3. $160 4. $200 5. $250 | c**) $**200  C = Total Cost x = # of days y = # of miles  Equation: C = 37.99(x) + .39(y)  Estimate Amounts: C= 40x + .40x  Substitute and Solve: C = 40(4) + .40(100)  C = 160 + 40 = $ 200 |
| **Problems PA Core Math Look Solutions** | |
| 1. A company is offering a salary of $48,500 per year. If 20% is deducted for taxes, how much will a person have made in 5 years after taxes? | $50,000 salary estimate. 10% is $5,000, so 20% is $10,000.  5 years x $10,000 tax/year = $50,000 taxes in 5 years.  $50,000 salary x 5 years = $250,000 estimated salary for 5 years  $250,000 (estimated salary) – 50,000 (estimated taxes) **=** $200,000 (estimated net, or after tax income for 5 years) |
| 1. Every hour, the store sells between 40-50 items that range from $1.99 - $7.99. What would be a good estimate for the amount of money the store generates in a 10 hour day? | 45 = Average of 40-50  $5 = Average $1.99 and $7.99  45 items x $5 = $225 per hour  $225 per hour x 10 hours = $ 2,250.00 per day |
| 1. Two friends went to dinner. Their bill came to $37.79. If a fair tip is between 15 and 20 percent, what would be a fair tip to leave their waiter? | Estimate a $40 bill.  10% is $4.  20% is $8  A fair tip would be any dollar amount between $6 and $8. |