Three Bean Salads

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| **PART ONE:**  ***Three bean salads*** | This activity is based on a similar activity from *Family Math* by Jean Stenmark, Virginia Thompson and Ruth Cossey. |
| **How to:**  *(Use Three Bean Salads - 23)*  *(Use Three Bean Salads - Extension - 24)* | 1. Making the salads  * Each salad has red beans, pinto (brown) beans and haricot (white) beans. * In groups of no more than three, students share their clues, by reading them to the group, and then make the salad. * Students record the number of each type of bean needed for each salad. (*Use recording sheet 1 - 25*)  1. Extending making the salads  * Get students to make up the clues for the salads given. * Get students to make up the salads and the clues. |
| **PART TWO:**  ***Converting the words into symbols.*** | Using the three bean salads from above the students practice writing the words using algebraic symbols. |
| **How to:** | * Let *r* stand for the number of red beans, let *p* stand for the number of pinto beans, and let *h* stand for the number of haricot beans. (They may prefer *b* for brown and *w* for white. Ask them.) * For each problem write three algebraic statements based on the information given. * Students should be encouraged to work in the same groups again. Each person is responsible for writing the statement for their part of the problem. They share their answers. All must agree on the answer before it is written down. They can hand in a group response, but all are responsible. (*Use recording sheet 2 - 26*) |

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| **Example 1.** | For salad 1. (Solutions given are from left to right from the master.)   1. *r* + *p* + *h* = 20 There are 20 beans in all in this salad. 2. *p* = 3 There are three pinto beans in this salad. 3. *r* = 2*p* There is twice as many red beans as pinto beans.   The last one can cause difficulty. Students often want to write it as 2*r* = *p*. It is worthwhile spending a little time this. | | |
| **Example 2.** | For salad 10.   1. *r* + *p* + *h* = 25 There are 25 beans in all in this salad. 2. *r* = *p* + 5 There are five more red beans than pinto beans. 3. *h* = *r* + 6 There are six more haricot beans than red beans.   For all the solutions above any correct rearrangement of the same statement is correct also. | | |
| **Answers:** |  |  |  |
| **2.** | 1. *r* + *p* + *h* = 18 | 1. *r* = 10 | 1. *h* = *r/*2 |
| **3.** | 1. *r* = 18 | 1. *p* = *r/*6 | 1. *r* + *p* + *h* = 33 |
| **4.** | 1. *r* + *p* + *h* = 35 | 1. *h* = 4 | 1. *p* = 7*h* |
| **5.** | 1. *r* + *p* + *h* = 12 | 1. *r* = 6 | 1. *p* = *r/*2 |
| **6.** | 1. *h* = 4 | 1. *p* + *h* = *r* | 1. *r* = 2*h* |
| **7.** | 1. *r* + *p* + *h* = 57 | 1. *p* = 57/3 | 1. *r* = *p* - 17 |
| **8.** | 1. *r* + *p* + *h* = 7 | 1. *r* = 2 | 1. *r* + *h* = 5 |
| **9.** | 1. *h* = 3 | 1. *r* = 2*h* | 1. *p* = *r/*6 |
| **11.** | 1. *r* + *p* + *h* = 30 | 1. *h* = 6 | 1. *r* = *p* |
| **12.** | 1. *r* + *p* + *h* = 14 | 1. *r* = 3 | 1. *p* = *r* + 4 |
| **13.** | 1. *r* + *p* + *h* = 24 | 1. *p* + *h* = *r* | 1. *h* = *r* - 3 |
| **14.** | 1. *r* + *p* + *h* = 28 | 1. *p* = 6*h* | 1. *h* = 3 |
| **15.** | 1. *r* = 4 | 1. *p* = *r* + 2 | 1. *r* + *p* = *h* |
| **16.** | 1. *r* = 2 | 1. *p* = 2*r* | 1. *h* = 2*p* |
| **17.** | 1. *r* + *p* + *h* = 59 | 1. *h* = 7*p* | 1. *r* = 3*p/*7 |

**THREE BEAN SALADS - 23**

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| 3 Bean Salads  Each salad has red beans, pinto (brown) beans and haricot (white) beans.  In groups of no more than three share your clues, (by reading them to the group), and make the salad.  Record the number of each type of bean needed for each salad. | | |
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| 1. There are 20 beans in all in this salad. | 1. There are three pinto beans in the salad. | 1. There are twice as many red beans as pinto beans. |
| 2. There are 18 beans in all in this salad. | 2. There are ten red beans in this salad. | 2. There are half as many haricot beans as red beans. |
| 3. There are 18 red beans in this salad. | 3. There are  as many pinto beans as red beans. | 3. There are 33 beans in all in this salad. |
| 4. There are 35 beans in all in this salad. | 4. There are four haricot beans in this salad. | 4. There are 7 times as many pinto beans as haricot beans. |
| 5. There are 12 beans in all in this salad. | 5. There are six red beans in this salad. | 5. There are half as many pinto beans as red beans. |

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| 6. There are exactly four haricot beans in this salad. | 6. Red beans make up half this salad. | 6. Red beans are double the number of haricot beans. |
| 7. There are 57 beans in all in this salad. | 7. Pinto beans make up one third of this salad. | 7. There are 17 less red beans than pinto beans in this salad. |
| 8. There are seven beans in all in this salad. | 8. Two of the beans are red. | 8. Five beans in this salad are not pinto beans. |
| 9. There are three haricot beans in this salad. | 9. There are twice as many red beans as haricot beans. | 9. There are  as many pinto beans as red beans. |
| 10. There are 25 beans in all in this salad. | 10. There are five more red beans than pinto beans. | 10. There are six more haricot beans than red beans. |
| 11. There are 30 beans in all in this salad. | 11. There are six haricot beans in this salad. | 11. There are as many red beans as pinto beans in this salad. |

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| 12. There are 14 beans in all in this salad. | 12. There are three red beans in this salad. | 12. There are four more pinto beans than red beans. |
| 13. There are 24 beans in all in this salad. | 13. Half the beans are red. | 13. There are three less haricot beans than red beans. |
| 14. There are 28 beans in all in this salad. | 14. There are six times as many pinto beans as haricot beans. | 14. There are three haricot beans in this salad. |
| 15. There are four red beans in this salad. | 15. There are two more pinto beans than there are red beans. | 15. Red beans and pinto beans make up half the salad. |
| 16. There are two red beans in the salad. | 16. There are twice as many pinto beans as red beans. | 16. If you double the number of pinto beans you get the number of haricot beans. |
| 17. There are 59 beans in all in this salad. | 17. There are 7 times as many haricot beans as pinto beans. | 17. There are  as many red beans as pinto beans. |

**THREE BEAN SALADS - EXTENSION - 24**

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| Three Bean Salads  Make up your own set of clues for these salads. You should write three clues for each salad. The clues must allow the salad to be made. | A. This salad has:  6 red beans  10 pinto beans  5 haricot beans  Write three clues to help someone solve the problem, (i.e. make the salad). | B. This salad has:  15 red beans  5 pinto beans  6 haricot beans  Write three clues to help someone solve the problem, (i.e. make the salad). |
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| C. This salad has:  3 red beans  9 pinto beans  12 haricot beans  Write three clues to help someone solve the problem, (i.e. make the salad). | D. This salad has:  15 red beans  10 pinto beans  8 haricot beans  Write three clues to help someone solve the problem, (i.e. make the salad). | E. This salad has:  3 red beans  5 pinto beans  2 white beans  Write three clues to help someone solve the problem, (i.e. make the salad). |

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| Three Bean Salads  Make up your own salad using the three beans.  Write three clues to help someone solve the problem (i.e. make the salad).  Give your clues to someone else and see if they make the salad you expected. |

**THREE BEAN SALAD RECORDING SHEET 1 - 25**

GROUP MEMBERS

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| Bean Salad Number | Number of Red Beans | Number of Pinto Beans | Number of Haricot Beans |
| 1. |  |  |  |
| 2. |  |  |  |
| 3. |  |  |  |
| 4. |  |  |  |
| 5. |  |  |  |
| 6. |  |  |  |
| 7. |  |  |  |
| 8. |  |  |  |
| 9. |  |  |  |
| 10. |  |  |  |
| 11. |  |  |  |
| 12. |  |  |  |
| 13. |  |  |  |
| 14. |  |  |  |
| 15. |  |  |  |
| 16. |  |  |  |
| 17. |  |  |  |

**THREE BEAN SALAD RECORDING SHEET 2 - 26**

GROUP MEMBERS

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| Bean Salad Number | Let *r* stand for the number of red beans, *p* stand for the number of pinto beans and *h* stand for the number of haricot beans.  Write algebraic statements to represent the words. | | |
| 1. | *r* + *p* + *h* = 20 | *p* = 3 | *r* = 2*p* |
| 2. |  |  |  |
| 3. |  |  |  |
| 4. |  |  |  |
| 5. |  |  |  |
| 6. |  |  |  |
| 7. |  |  |  |
| 8. |  |  |  |
| 9. |  |  |  |
| 10. | *r* + *p* + *h* = 25 | *r* = *p* + 5 | *h* = *r* + 6 |
| 11. |  |  |  |
| 12. |  |  |  |
| 13. |  |  |  |
| 14. |  |  |  |
| 15. |  |  |  |
| 16. |  |  |  |
| 17. |  |  |  |