Using Candy to Represent Equivalence Relations – Class Handout

Use your bag of candy to complete the following activities. For each activity, there are one or more related problems to help you connect the activity to the concepts about equivalence relations.

Part 1:
Organize your pieces of candy into piles so that the pieces of candy in each pile are alike in some way. Each piece of candy must be placed into some pile. No piece of candy can be in more than one pile.

1. Describe the criterion that you used to organize the candy.

2. Do the individual piles of candy satisfy the definition of an equivalence class? Explain why or why not.

3. Looking at all of the piles of candy collectively, do they satisfy the definition of an equivalence relation on your bag of candy? Explain why or why not.

4. Illustrate the properties of an equivalence relation (reflexive, symmetric, and transitive) using your grouping of the candy. Write out your responses.

5. Looking at all of the piles of candy collectively, do they satisfy the definition of a partition of your bag of candy? Explain why or why not.

Part 2:
Organize your candy into piles using a different set of criteria. As before, each piece of candy must be placed into some pile. No piece of candy can be in more than one pile.

6-8. Complete Problems 2-4 for this new arrangement.

Part 3:
Organize your candy again, using a set of criteria that is different from what you used the first two times. Again, each piece of candy must be placed into some group. No piece of candy can be in more than one pile.

9-11. Complete Problems 2-4 for this arrangement of your candy.

12. Reflecting on what you have learned from this exercise, explain the relationship between partitions and equivalence relations of a set.