1) **Lesson Title:** Beading Input/Output Tables -- Grade 3

2) **Lesson Overview:** Students will look at beading patterns and use them to create input/output table.

3) **Instructional Goals:** Students will understand the importance of beading in the Native American culture, both present day and past. Patterns can be generalized to an algebraic rule using input/output tables.

4) **Formative Assessment:** Students will complete a beading pattern using graph paper and find the in/out table values for their design.

5) **Lesson Organization:**

6) **Opening the Lesson:** (10 minutes)
   - ❑ Discuss the history of beading in the Native American culture (see top of worksheet 1) as well as its importance in today's culture. Beading is used as a decoration on clothing for pow wows and other gatherings. It is also used as an income source for Native Americans. They sell their items locally at pow wows and gatherings, as well as across the nation through websites and catalogues.
   - ❑ Today we are going to complete in/out tables based on the number of beads needed for different projects. Show examples of different beaded projects (see attachment A, B and C). We want to see how many beads will be needed for different projects.

7) **Developing the Lesson**: (40 minutes)
   - ❑ We are going to look at a key ring project. (show example) How many beads does it take to make one key ring? (150) What if I made two chokers, how many beads will I need? (300) How did you find your answer? (Take different responses: I added 150; I multiplied 150 by 2; I doubled 150, etc.)
   - ❑ What if I make 3 chokers, how many beads will I need? (450) How did you find your answer? (added another 150; multiplied 150 by 3) Did doubling the previous answer work? (No) Why not? (because you can only add 150 this time, not 300; since it is 150 per choker)
   - ❑ Continue with the table until students understand how to compute each output value.
   - ❑ Show examples of the choker and bracelet. Have students work on tables 2 and 3 with a partner. Share responses as a whole group. What patterns are you noticing about your tables? (the input increases by one; the output increases by the value of the number of beads)
   - ❑ Show the necklace pattern. Tell students that this time there is 2 different things to compute… the number of beads and the number of shells needed to complete the necklace. As they are working on the table, encourage them to look for patterns. As students work independently, circulate and ask individual students about the patterns they are seeing as they find the beads, the shells and the totals. See if students recognize that the total is increasing by 68 each time and why that is. (50 + 18 = 68)
   - ❑ Give students a piece of paper (some students may need graph paper) and have them create their own bead pattern for a bracelet, necklace, choker or other item.
   - ❑ After their pattern is complete, ask them to complete an in/out table for the number of beads that they used.