**Cutting Yarn Activity**

*After this lesson, you should be able to: Use collected data to write an exponential model.*

**Step 1: Fold and Cut**

Take your length of yarn. Consider it to be 1 unit long. Fold it in half and cut. You are now left with two pieces of yarn, each half the length of the original piece of yarn.

**Step 2: Complete the Table**

For each stage, fold *all* the pieces of yarn in half and cut. Then record the number of new pieces and the length of each new piece until the table is complete.

|  |  |  |
| --- | --- | --- |
| Stage | Number of Pieces | Length of each new piece |
| 1 | 2 | ½ |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |

Step 3: Drawing Conclusions

1. Use the data in the first and second columns of the table.
   1. Does the data represent an exponential function? Explain how you know.
   2. Write a function that models the number of pieces of yarn at stage x.
   3. Use the function to find the number of pieces of yarn at stage 10.
2. Use the data in the first and third columns of the table.
   1. Does the data represent an exponential function? Explain how you know.
   2. Write a function that models the length of each new piece of yarn at stage x.
   3. Use the function to find the length of each new piece of yarn at stage 10.