Lesson: TinyTys™ "Patterning and Attributes"	**Teacher:**

CCSS/Aligned STEM:
MATHEMATICS Geometry-
CCSS.MATH.CONTENT.K.G.A.2
    Correctly name shapes regardless of their orientations or overall size.
CCSS.MATH.CONTENT.K.G.B.4
    Analyze and compare two- and three-dimensional shapes, in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length).
 	
NGSS:
SCIENCE Structures & Properties-
2-PS1-1
    Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
 	
ISTE:
Creativity and Innovation
Critical Thinking, Problem Solving, and Decision-Making
 	
DOK: Depth of Knowledge Levels 3 & 4 Construction/Design and Extended Thinking
	Lesson Objectives
	1. TLW create and extend patterns using TinyTys™
	2. TLW describe attributes of shapes in their patterns using word bank/vocabulary: pattern, random, attribute, curves, sticks, corners/vertices, long, short, open or closed shapes, long, longer, longest.
	3. TLW report how they selected and placed their chosen shapes using vocabulary in word bank.
	
	Materials
	1. TinyTys™ Jewelry Kit(s)
	2. Paper, pencil, markers
	3. "My Best Pattern" handout
	4. Word bank listed on chart paper or white board.

Content	**Teacher/Anecdotal/Reflection Notes**
Anticipatory Set: Guessing Game Teacher chooses a shape, but holds it hidden while he/she describes its attributes using vocabulary in the word bank. Students are encouraged to guess which shape/color he/she is holding. The teacher points out that when we describe a shape, we call that an attribute. We will learn that patterns also have attributes later in the lesson.	
Input **Task Analysis** 1. Teacher presents each student with one shape from TinyTys™ pendants, charms, or monograms. 2. Students Think/Pair/Share, describing the	

attributes of the piece using color, shape or size vocabulary.

3. Teacher plays the guessing game with the class again, prompting students to guess the attributes of a hidden piece based on clues teacher gives.
4. Once students identify the piece's attributes, teacher declares this piece the first in a pattern.
5. Teacher repeats the "guessing game" twice more, allowing students to guess attributes of the piece, each time declaring it as "next" in the pattern.
6. Teacher patterns explains that repeating pieces with the same attributes again will create a 3-attribute pattern.
7. Teacher distributes a pile of TinyTys™ (both Tiny and Bangle sizes).
8. Teacher prompts students to connect the tys in a pattern of their choice. Students may work individually or with a partner.
9. Each student reports to the class how many attributes his/her pattern has.
10. Students complete the "My Best Pattern" handout.

Check for Understanding
(Periodically)
How would you describe your shapes? How many attributes did you use in that pattern? How many attributes is your friend using? Which pattern is longer? Who has the longest pattern? Are you describing the length of the extension, or the number of attributes in the pattern? Do you like to pattern? Why or why not? Can you make a random string of shapes?

Guided Practice
As students work with materials, teacher circulates the room, stopping to recognize when vocabulary from the word bank is used in class discussions.Teacher assists with classifying the work as "patterned" or "random." Teacher allows students to disassemble and rebuild patterns as they explore materials and use new vocabulary. Teacher circulates the room and allows faster

workers to begin on their "My best TinyTys™ pattern" handout.	
Independent Practice Students finish creating and describing their pattern. Students are encouraged to extend the pattern and increase or level up the difficulty by making the pattern with more attributes. Students record their best patterning on the "My Best TinyTy Pattern" handout. If time, students can collaborate on a joint pattern project using TinyTy or their handouts.	
Extension Students may utilize all items in TinyTy kits to create, extend and record their patterns, labeling attributes or adding shapes to make patterns more difficult. Students count, extend and describe attributes of shapes in the kit and real world, comparing and contrasting them.	