Na’am: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**They Magical Mystery Tube…”*Roll up…”***

**Overview**: This lesson serves as a good introduction to the nature of scientific inquiry. Students are asked to determine what the interior construction of a mystery tube looks like. Working in small groups, students pose explanations (hypotheses) for what they are observing and are asked to test their hypotheses.

**Lesson concepts**:

* The process of science involves testing ideas about the natural world with data from the natural world.
* The process of science involves observation, exploration, discovery, testing, communication, and application.
* Scientists try to come up with many different natural explanations (i.e., multiple hypotheses) for the patterns they observe.
* Scientists test their ideas using multiple lines of evidence.
* Test results sometimes cause scientists to revise their hypotheses.
* Scientists are creative and curious.
* Scientists work together and share their ideas.

**Materials**:

* One Magical Mystery Tube per group of students — diagram and supply list below
* Scratch paper for drawing diagrams
* Packets/zip lock bags for building models (see step 5 below). These should contain a variety of items that they might use to build a model: scissors, paper punch, buttons, string, beads, rings, paper clips and also printer paper.

**Time**: One class period

**~~~~~WRITE STUDENT RESPONSES BELOW~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~**

**Question:** Question you are attempting to answer through this investigation:

**Hypothesis:**

‘If, then’ statement to show cause and effect:

**Predictions:**

1. What do you think will happen when you pull one of the strings?

2. What do you think the evidence you gather will consist of?

**Diagram** of Mystery Tube (include dimensions):

**Observations:**

**Data Analysis:**

How will you analyze your data?

**Patterns:** Did you observe patterns or relationships within the data from this investigation?

What does your data tell you about the way in which the strings interact within the Mystery Tube?

Was your prediction about the response of the strings when only one is pulled?

Based upon your observations, how do you think the strings are arranged within the Mystery Tube? If you have multiple theories, you can state them all here.

**Conclusion/Explanation:**

Look back to your observations and your data, collaborate with your partner and develop an explanation supported by your data for this investigation. Use that explanation and collaborate with your team to construct a new Mystery Tube. Include a diagram of your **model** to explain your solution.

**Reflection Questions:**

1. Why do scientists use models?

2. Think of an example of a model that could help you learn about something that is difficult or possibly too small to see.

3. Think of an example of a model of a very large object or system that could help you to understand the object or system.

4. What other disciplines rely upon models to understand systems or objects?

5. How did searching for patterns contribute to your understanding of the Mystery Tube?

6. Did ideas offered by teammates help you to think about the model from a different perspective and, as a result, better understand the model?