|  |
| --- |
| ***Student Hypothesis*** ***Sample of Beginning Levels of Mastery*** ***Science Learning Target 101.1:*** ***I can identify and create questions and hypotheses that can be answered through scientific investigations***. This means that I can write interesting questions that can be tested and can generate hypotheses written in proper, “If \_\_\_\_\_\_\_, then \_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_” format.  |
| **Primary Indicator:** Students are writing hypotheses for both their spaghetti labs and their paper towel labs.  These hypotheses will be evaluated for mastery.  these exemplars are drawn from the hypotheses written during the spaghetti lab. |
| ***Exemplar*** | ***Teacher Comments*** |
| If we make many cubes and diagonals and stick them up and also if we break the spaghetti into smaller pieces, then the tower will be more sturdy.  | 1. A strength of this hypothesis is that it is focused on the topic that we are studying---building towers out of spaghetti.
2. The "If" section---which spotlights the variable the student scientist wants to test (the independent variable)---includes too many variables.  The student should have focused on cubes OR diagonals OR broken spaghetti---not all three.
3. The "Then" section---which spotlights the dependent variable in an experiment---doesn't include something that is easy to measure.  I would change "more sturdy" to "taller."  Height is easy to measure.
4. This hypothesis is missing a "Because" section completely.  We don't know why the student scientist believes that her changes will result in a taller tower
 |

|  |
| --- |
| ***Student Hypothesis*** ***Sample of Developing Levels of Mastery*** ***Science Learning Target 101.1:*** ***I can identify and create questions and hypotheses that can be answered through scientific investigations***. This means that I can write interesting questions that can be tested and can generate hypotheses written in proper, “If \_\_\_\_\_\_\_, then \_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_” format.  |
| **Primary Indicator:** Students are writing hypotheses for both their spaghetti labs and their paper towel labs.  These hypotheses will be evaluated for mastery.  these exemplars are drawn from the hypotheses written during the spaghetti lab. |
| ***Exemplar*** | ***Teacher Comments*** |
| We are creating a spaghetti tower with a heavily supported base, which will hold it up better. The reason why our spaghetti tower’s base will hold up the tower is because we have it sort of shaped like a pyramid, which will withstand the force acting on it. The base would also help the higher part of the tower straighten out more.   | 1. A strength of this hypothesis is that it includes a logical explanation of why the student scientist believes that his design will be effective.
2. It is also important to notice that the student scientist is testing only one variable—a heavily supported base—in his experiment.
3. The hypothesis is not written in “If, then, because” format, however. It also never mentions a dependent variable—or a result that we can measure.
4. It would also have been interesting to see this student scientist connect his thinking back to something else he knows from other experiences with towers and building.
 |

|  |
| --- |
| ***Student Hypothesis*** ***Sample of Mastering Levels of Mastery*** ***Science Learning Target 101.1:*** ***I can identify and create questions and hypotheses that can be answered through scientific investigations***. This means that I can write interesting questions that can be tested and can generate hypotheses written in proper, “If \_\_\_\_\_\_\_, then \_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_” format.  |
| **Primary Indicator:** Students are writing hypotheses for both their spaghetti labs and their paper towel labs.  These hypotheses will be evaluated for mastery.  these exemplars are drawn from the hypotheses written during the spaghetti lab. |
| ***Exemplar*** | ***Teacher Comments*** |
| If we used reinforced sides on a triangle base, then our tower will be taller because the sides will have two pieces of spaghetti each, making them stronger. This will let us keep building and building until our tower is really strong. I know this because when you look at anything that supports anything else, it isn’t weak or it will snap.   | 1. This hypothesis is written in perfect “If, then, because” format. There is one independent variable (reinforced sides), one dependent variable (our tower will be taller) and a sensible because section.
2. Some readers may think this student scientist is talking about two independent variables in the “If” section—reinforced sides AND a triangle base.
3. The details in the “Because” section are logical and connected to the “If” section.
4. The final sentence is a little hard to understand. While most readers will be able to guess at what the student scientist is trying to say, readers shouldn’t have to guess!
 |

|  |
| --- |
| ***Student Hypothesis*** ***Sample of Excelling Levels of Mastery*** ***Science Learning Target 101.1:*** ***I can identify and create questions and hypotheses that can be answered through scientific investigations***. This means that I can write interesting questions that can be tested and can generate hypotheses written in proper, “If \_\_\_\_\_\_\_, then \_\_\_\_\_\_\_ because \_\_\_\_\_\_\_\_” format.  |
| **Primary Indicator:** Students are writing hypotheses for both their spaghetti labs and their paper towel labs.  These hypotheses will be evaluated for mastery.  these exemplars are drawn from the hypotheses written during the spaghetti lab. |
| ***Exemplar*** | ***Teacher Comments*** |
| If we reinforce our spaghetti, then our tower will be taller because it will stand up straight. Our previous design didn’t have enough support from the middle of the tower and our marshmallow pulled the tower down. If the middle is reinforced, then our tower should have the strength to hold up the marshmallow.  | 1. This hypothesis begins with a clear, concise, and easy to understand “If, then, because” sentence. There is one independent variable (reinforced spaghetti), one dependent variable (will be taller) and a direct “because” statement (it will stand up straight).
2. The “because” details are connected to the hypothesis.
3. The main difference between this hypothesis and the “Mastering” exemplar is that this student scientist has referred to his previous experiences with tower building.
4. By referring to previous experiences, this student scientist shows that they are working through a process of scientific exploration. That’s a characteristic of an accomplished scientist.
 |