Inq-ITS

Inq-ITS Teacher Guide to Science Inquiry

HYPOTHESIS	COLLECT DATA	ANALYZE DATA	EXPLAIN FINDINGS

A video tutorial of this document is here: https://www.youtube.com/watch?v=NNmYnTQPz4Q

Hypothesis

Each Virtual Lab consists of 3 to 4 different activities. Every activity contains a specific goal that is meant to help students create a **hypothesis**.

For each goal students will need to create a testable hypothesis. There are two different types of Hypothesis Generators. The first kind allows students to create a sentence from a series of choices available by pressing on the arrow in each box. The student's next step is highlighted in green. The second type of Hypothesis Generators allows students to create a hypothesis by clicking on one choice from each box.

Each Hypothesis Generators requires students to identify Independent and Dependent Variables. Students are scored on they correctly identify the Independent and Dependent Variables, as well as whether or not they were aligned with the goal.

Collect Data

For each activity students will need to **collect data** in order to test their hypothesis. *The Inq-ITS Virtual Labs allow students to make choices and test their hypothesis by clicking on different selections and running as many trials as needed in order to test their hypothesis.*

As students run trials, they collect data in the results section so they can see whether the data support or refutes their hypothesis. Students are scored on their ability to target their independent variable and control their investigation.

Analyze Data

Students will then move on to **analyze** their findings using the Analysis Generators. There are two different types of Analysis Generators. The first kind allows students to create a sentence from a series of choices available by pressing on the arrow in each box. The second type of Analysis Generators allows students to create an analysis claim by clicking on one choice from each box.

The claim should state whether the data support or refuted the Original Hypothesis.

In order to complete the Analyze Data section, students need to select which trials support their Claim.

Students are scored on whether they can correctly construct a claim and if they can support that claim with evidence.

Goal
Determine how the planetary body we are orbiting affects the mass of the gold.

My Hypothesis
If I change the planetary body we are orbiting so that it has more gravity than the planetary body we were orbiting, the mass of the gold will stay the same.
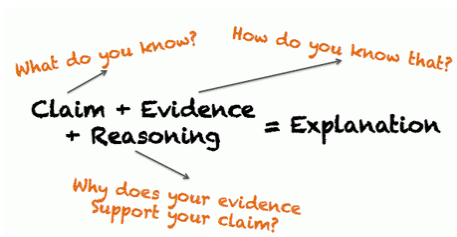
My Claim
When I changed the [planetary body we were orbiting ▼] so that it [had more gravity than the planetary body we were orbiting ▼].
the [mass of the gold ▼] then [Choose One... ▼].
This [Choose One... ▼] my hypothesis

My Evidence
These trials are evidence of my claim: 8, 7, 4, 2, 1,

Select	Trial #	Gold Bars	Planetary Body	Planet Gravity	Orbit Distance	Gold's Mass (grams)	Gold's Weight (Newtons)	Gravity in Orbit (% of Earth)
☑	1	1	Moon	1.6	surface	1000	1.60	16
☑	2	1	Mars	3.7	surface	1000	3.70	38
☐	3	1	Venus	8.9	far	1000	7.80	80
☑	4	1	Earth	9.8	close	1000	9.50	97
☐	5	3	Moon	1.6	far	3000	3.30	11
☐	6	3	Earth	9.8	far	3000	26.10	89
☑	7	3	Venus	8.9	far	3000	23.40	80
☑	8	3	Mars	3.7	far	3000	9.00	31

Explain Findings

Students are asked to **explain their findings** by forming a Claim, supporting their Claim with Evidence, and describing their Reasoning.

What do you know? How do you know that?

Claim + Evidence + Reasoning = Explanation

Why does your evidence support your claim?

In the Claim Section students need to state what they know. In other words, what is their conclusion about the original goal.

In the Evidence Section they need to outline how they know what they stated in the Claim. Students need to include the scientific data that supports their claim.

Finally, in the Reasoning Section students should explain why their evidence supports their claim. This is where they connect evidence to their claim.

Claim
Write a sentence that states what you found out about the scientific question you just investigated. Provide enough detail so that a friend who did not do the experiment could learn from your description.

Evidence
Provide and describe scientific evidence from your data table that supports (or refutes) your claim. Remember to provide enough detail so that a friend who did not do the experiment could learn from your description.

Reasoning
Explain why your evidence (what you wrote in Box 2) supports your claim (what you wrote in Box 1). Remember to provide enough detail so that a friend who did not do the experiment could learn from your description.