Claim Evidence Reasoning (CER)

Model 1: Student Chemistry Test Data

Student	**Test Grades**	**Time Spent Studying**	**Homework Completed**
Stephanie	93	2 hours	Yes
Kristen	45	15 minutes	No
Martin	60	1 hour	No
Jessica	80	1 hour	Yes
Michael	63	2 hours	Yes

1. Which student scored the highest chemistry test grade? Stephanie
2. How many students passed the chemistry test? 2
3. How does time spent studying affect chemistry test results? Increased time tends to have higher grade
4. How does homework completion affect chemistry test results? Completing HW tends to have a higher grade

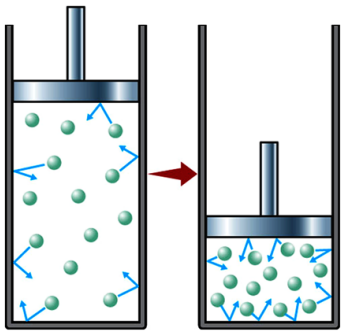
A **claim** is an answer to the guiding question supported by the evidence from the experiment.

Guiding question: How does time spent studying and homework completion affect test results?

5. Use your responses in questions 3 and 4 to develop a claim. Students who complete HW and study more tend to have higher grades

Model 2: Gas Particles

How does decreasing the volume of a gas affect the particles?



7. A student makes the claim that the molecules move faster when heated. Why would this not be an appropriate claim?

The experiment/model shows the change in volume not the change in temperature

Model 3:

Four basketball players have the following statistics for free throws:

Name	Baskets Made	Baskets Missed	Game Location
Amy	8	2	Forest Hills
Bob	12	8	Deer Park
Charles	6	4	Smithtown
Daniel	15	5	William Floyd

Two students make the following **claims**:

Student A: “Daniel made the most baskets so he is the best free throw shooter”

Student B: “Even though Amy took fewer shots, she is the best free throw shooter”

Evidence is specific data that supports the claim and can be quantitative or qualitative. It should provide enough information to validate the claim. Not all data collected in an experiment is considered "evidence."

7. Use evidence from the data table to support student A. Daniel had the most baskets -15

8. Use evidence from the data table to support student B. Amy had a better shooting percentage 80% (8/10) compared to Daniel's 75% (15/20)

Model 4: Reasoning/Justification

Guiding Question:
Why do some objects float and some sink in water?

Contents	Classic Coke	Diet Coke	Visual Observation
Total Volume	355.0 mL	355.0 mL	
Water Mass	355.0 g	355.0 g	
Sugar Content	39.0 g	0.0 g	
Nutra Sweet Content	0.0 g	0.1 g	
Total Mass	394.0 g	355.1g	
Density	1.110 g/mL	1.000 g/mL	

Below are a series of claims. Using the data provided, which of the following would provide an appropriate and comprehensive answer to the guiding question?

Student A: The gas bubbles caused the diet coke to float.
Student B: The red color of the can caused it to sink.
Student C: The position of the red can caused it to sink.
Student D: If you drink diet coke you will float.
Student E: Coke has a density greater than diet coke.

Student F: The mass to volume ratio of coke is greater than diet coke.

Students E and F used the total mass and the density of the two samples to explain why Diet Coke can floats.